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# **ASSESSMENT OF THE NAVY'S NORTH WEST REGION ADVANCE FOOD MENU GALLEY WORKLOAD AND FOOD COST IMPACT TRADE-OFFS**

**by  
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**U.S. Army Natick Soldier Research, Development and Engineering Center  
Natick, Massachusetts 01760-5020**

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14. ABSTRACT  In support of the Navy force structure initiatives to reduce future shipboard staffing levels, the Navy Installation Command is evaluating alternative ashore galley operational and menu concepts to also reduce ashore galley Culinary Specialist (CS) workloads and required staffing levels. This report documents an independent assessment of the Navy's North West Region (NWR) Advance Food Menu (AFM) pilot operation conducted at the Naval Air Station (NAS) Whidbey Island Admiral Nimitz galley. The assessment was performed for the Navy Installation Command in 2008 by the U.S. Army Natick Soldier Research, Engineering and Development Center (NSRDEC). The AFM was designed to reduce galley workloads by having fewer from-scratch menu items and a larger mix of speed-scratch and advance food items than the Standard Ashore Menu (SAM). Specific goals and objectives for this project were to assess the galley workload impacts, food cost impacts, and trade-offs generated by the AFM relative to those associated with the NWR SAM. This report documents overall project efforts to include: objectives, data collection procedures and methodology, and assessment results, conclusions, and recommendations					
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## **Preface**

This report presents an assessment of the Navy's North West Region (NWR) Advance Food Menu (AFM) pilot operation conducted at the Naval Air Station (NAS) Whidbey Island Admiral Nimitz galley. The assessment was conducted by the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC), under Work Unit Number 85BG4A, during the period March 2008 to September 2008. It was sponsored and funded by the Navy Installation Command (NIC) under Program Element Number 068732.

The pilot AFM was designed to reduce the galley food preparation workloads of the NWR standard ashore menu by decreasing the number of from-scratch items and increasing the number of speed-scratch and advance food items. The overall assessment focused on the galley workload impacts, the galley food cost impacts, and the associated trade-offs generated by the AFM galley operations as compared to standard NWR ashore menu operations.



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## **Executive Summary**

At the request of the Navy Installation Command (NIC), the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC) conducted an assessment of the galley workload and food cost impacts generated by North West Region (NWR) Advance Food Menu (AFM) pilot galley operations. Three NWR ashore galleys participated in the pilot operation. The Navy selected the Naval Air Station (NAS) Whidbey Admiral Nimitz galley for data collection of galley workloads, food costs, and tradeoffs generated by AFM galley operations as compared to NWR Standard Ashore Menu (SAM) galley operations.

An earlier New London Advance Food Pilot involved a near 100% conversion to AFM items plus several other major operational galley changes such as: patron self-serve of all menu items to include entrées, expanded entrée selection, unlimited portions, unlimited take-out, and continuous non-stop breakfast through dinner meal period service. The New London pilot generated very large galley workload reductions, but also generated very large increases in galley food costs that more than offset labor cost savings associated with the reduced required galley staffing levels due to reduced galley workloads. Unlike the New London pilot, the NWR AFM only involved a moderate shift from menu items prepared from scratch to a higher combined mix of advance food and speed-scratch items to reduce overall galley workloads. From some aspects both menus were the same or very similar – e.g., breakfast egg items, lunch short order line, Whidbey salad bar. For the NWR pilot, there were no changes to other key galley operations potentially impacting galley workloads or food costs. The number of serving lines, meal period serving hours, main line entrée offerings, portion control procedures, and limits on patron take-out were the same as for pre-pilot (standard) galley operations.

The objectives of this study were to assess the galley workload and food cost impacts associated with the AFM as compared to the NWR SAM.

The NAS Whidbey Island galley AFM pilot operation was in place for 21 months from July 2006 through March 2008. To assess the workloads associated with each menu, 6 complete days (Tuesday through Sunday, 4 weekdays and 2 weekend days) of work sampling data covering end-to-end day watch operations were collected. The AFM workload data were collected 18-23 March 2008, and the SAM data were collected 3-8 June 2008.

For weekdays, the covered time period was from 5 AM to about 7:30 PM, and on weekend days from 7 AM to about 7:30 PM. With each menu, the galley also operated a night watch 5 days per week covering Sunday through Thursday, to support flight line work schedules and operations. The night watch prepped and served the night meal, and also prepped some menu items and completely prepared other menu items for the incoming day watch. Because the night watch was not covered by work sampling data collection, these workloads are not reflected in the collected galley workload data.

For the NWR AFM pilot, the participating galleys were authorized a set extra food cost allowance on top of the standard earned galley food allowances calculated based on rations served, allowances per ration, and various supplements. By fiscal year, standard target galley food cost expenditure goals are to be within 3% (plus or minus) of the galley earned food cost

allowance. For this assessment, extra food cost associated with the AFM pilot operations were estimated based on the simple difference between actual galley food costs and the galley's earned food allowances based on the standard Navy galley food cost allowances over the entire 21-month AFM pilot operation.

During the time periods for which workload data were collected for each menu, the AFM included a higher mix of advance and speed-scratch items for some meal components like lunch and dinner entrees. However, the overall differences were not large as for several other meal components both menus were the same or very similar. For example, the breakfast eggs were exactly the same or very similar for both menus in terms of the mix of advance, speed-scratch, and from-scratch preparation.

Based on all 6 days of collected workload data for each menu, the average total daily productive culinary specialist (CS), food service attendant (FSA), and combined CS and FSA work hours were very similar for both menus with only small differences. For CSs, total daily day watch productive work hours averaged 61.3 for the AFM and a slightly higher 63.1 for the SAM. Similarly for FSAs, average daily productive work hours were 55.9 for the AFM and a slightly higher 58.5 for the SAM. These differences are not considered significant given the observed and normal day-to-day variations for each menu to include differences in the weekdays and weekend results between menus. The AFM galley workload reduction benefits based on the actual collected data were smaller than those expected to be generated by the AFM. However, the actual AFM workload reduction benefits are likely higher than those estimated based on the actual collected work sampling data for 2 primary reasons:

- The food prep work for some of the items on the SAM served during the 4 weekdays was not recorded. Based on a review of the workload data results, it appears the night watch (not covered by workload data collection) completed more of the weekday day watch food prep workload for the SAM than for the AFM. Specific examples include from-scratch prepared breakfast pastries and batters for from-scratch griddle cakes. These items were prepared by the night watch and ready to serve with the arrival of the day watch, resulting in omission of this workload from the SAM workload data. The breakfast pastries in the AFM were all commercial ready-to-serve advance food items involving no work effort. Because no night watch preceded the weekend day watch, the underestimated workload for the SAM occurred only on the weekdays, as the weekend day watch needed to completely prepare all of their menu items.
- Some of the advance food items on the pilot AFM were not available during the week that the workload data were collected, requiring substitution of the higher labor from-scratch SAM items. The AFM workload data were collected near the end of the pilot operation period and just prior to planned transition back to SAM galley operations. As a result, the galley had begun to remove some of the AFM advance food items. One prime example was the One National Stock Number (1-NSN) meals (all advance food heat and serve items), which were part of the AFM for some lunch and dinner meal periods.

Over the 21-month pilot operation, galley food cost expenditures varied considerably month to month compared to standard monthly earned food cost allowances. Based on the standard Navy ration cost allowance factors, the galley's monthly average earned food allowance

was \$8.82 per ration at the start (July 2006) of the pilot and \$9.81 per ration at the end (March 2008). The actual monthly pilot food costs fluctuated from 2% under to 18% over the standard galley food cost allowances. For the entire 21-month pilot operation, galley food costs were 10% (\$174K) higher than the standard food cost allowances, or an extra \$0.87 per earned ration credit. The extra food costs tended to be highest at the start and lowest at the end of the pilot operation. For the first 6 months, the extra cost average was about 14% higher as compared to about 8% for the last 6 months. Based on both the actual AFM food costs during the entire NWR pilot operation and the 6 days of day watch workload data for both menus, the extra food costs were higher than any potential labor savings. As previously mentioned, actual AFM galley workload reduction benefits are very likely larger than those reflected by the collected data. However, there is no means to reliably estimate these potential AFM workload reduction benefits.

# **ASSESSMENT OF THE NAVY'S NORTH WEST REGION ADVANCE FOOD MENU GALLEY WORKLOAD AND FOOD COST IMPACT TRADE-OFFS**

## **1. Introduction**

### **1.1 Background**

In support of the Navy's force structure initiatives to reduce future overall shipboard manning levels, the Navy Installation Command (NIC) is evaluating alternative operational and menu concepts to reduce ashore galley culinary specialist (CS) workloads and required staffing levels. An earlier New London Advance Food Pilot involved a nearly 100% transition to commercial advance foods to reduce galley workloads plus other operational changes to further reduce workloads. That menu basically reduced CS galley food prep efforts for hot menu items to opening boxes and product reheating prior to placement on the serving line. The effort for non-hot items was reduced to simply opening boxes for direct placement of items onto the serving line. To further reduce CS workloads, all menu items, to include entrée items, were patron self-serve in unlimited portions and were available for take-out. The New London pilot demonstrated significant reductions in CS galley workloads. However, the near 100% transition to commercial advance foods coupled with self-serve unlimited portions and unlimited patron take-out for later consumption resulted in a very large increase in galley food costs. The extra food costs were significantly higher than the potential saved labor costs associated with reduced galley workloads and required galley CS staffing levels.

In July 2006, the Navy North West Region (NWR) initiated Advance Food Menu (AFM) operations at 3 of its ashore galleys as a follow-on pilot to the New London pilot. The NWR pilot AFM reduced the number of, but did not eliminate, the items prepared from scratch in the Standard Ashore Menu (SAM). Unlike the New London pilot, many from-scratch menu items were available on the NWR pilot menu, the CSs continued to staff/monitor the hot serving lines, and normal portion control standards and limits on patron take-out were maintained.

### **1.2 Study Sponsor**

The assessment of the NWR pilot AFM documented in this report was sponsored and funded by the NIC and was conducted by the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC) between March and September 2008. Of the 3 pilot galleys, the NIC chose the Naval Air Station (NAS) Whidbey Admiral Nimitz galley for the assessment.

### **1.3 Study Objectives**

The objectives of this study were:

- Assess the galley workload impacts generated by the NWR AFM as compared to the NWR SAM.
- Assess and compare the galley operational costs (labor and food) for the NWR AFM and SAM.

### **1.4 North West Region (NWR) Advance Food Menu (AFM) Pilot**

For the NWR pilot operation, there were only 2 differences in Admiral Nimitz galley operations as compared to the pre-pilot (standard) ashore galley operations.

The primary change from the standard NWR to the pilot operations was more speed-scratch and advance food products and fewer from-scratch items. The reduced mix of from-scratch items was designed to reduce food preparation and overall galley productive workloads (and resulting required staffing levels).

The second difference was a change in the financial controls on allowed galley food costs due to the increased mix of higher cost advance and speed-scratch menu items. For the pilot period, the galley was authorized an additional annual food cost allotment on top of earned galley food cost allowances based on the standard Navy galley food cost allowances and factors.

Other key factors that potentially impact galley workloads were the same for both standard ashore and pilot galley operations. These include: duration of meal period serving hours, number and type of serving lines per meal period, menu item variety or selections offered per meal period, general galley operations to include types and level of galley service, CS and food service attendant (FSA) breakout or coverage of galley work tasks, day-to-day specialty bars, main line item portion control and limits, permitted patron take-outs, financial reporting/tracking requirements, and galley paperwork and supply to galley issue procedures.

### **1.5 Galley Tasks by Worker Category**

During the workload data collection, the breakout of CS and FSA galley work tasks and associated work activities were clearly delineated and were the same for galley operations with both menus.

The CS-only work tasks were: galley supervision, check-in station, supply, galley records, food storage area work, cook/prepare food, kitchen equipment sanitation, kitchen area sanitation, and CS other productive.

The FSA-only work tasks were: Fresh Fruit and Vegetable (FF&V) preparation, salad/fruit bars, pot/pan sanitation, dinnerware sanitation, dining/serving areas, and FSA other productive.

One galley work task, serving lines, included both CS and FSA work activities. The serving line activities were divided into separate tasks for the 2 groups. For example, for the main hot serving lines, the CS work task covered serving line set-up and activities during the meal-period serving line (cleaning, monitoring, restocking, and patron serving); whereas the FSA work task covered all after meal-period serving line clean-up and sanitation activities.

One work task, equipment repair and maintenance, covered work hours expended by base installation maintenance personnel and galley CS personnel.

## **1.6 Galley Staffing**

To cover 7-day a week galley operations, the galley CS staff was organized into 2 separate alternating day watches and 1 night watch to cover the Sunday through Thursday, only flight line night meal. The 2 alternating day watches switched after the breakfast meal on Monday, Wednesday, and Friday. The incoming Monday day watch prepared the Monday lunch meal through the Wednesday breakfast meal, the incoming Wednesday day watch prepared the Wednesday lunch meal through the Friday breakfast meal, and the incoming Friday watch prepared the Friday lunch meal through the Monday breakfast meal. Each day watch covered two weekdays each week plus every other weekend. During weekdays, the day watch started at 5:00 AM and ended at about 7:30 PM. During weekends the day watch started at 7:00 AM and also ended at about 7:30 PM. The night watch prepared the midnight meal (offered Sunday through Thursday only) and prepped or prepared some of the menu items for the incoming Monday through Friday day watch. The night watch ended at 5:00 AM with the arrival of the day watch.

Weekday and weekend FSA staffing requirements were covered by multiple different worker shift schedules, covering parts of the overall day watch work day. FSA staffing levels and work schedules for the AFM pilot were the same as for pre-pilot galley operations.

## **2. Data Collection Methodology**

Work sampling data were collected to assess/estimate the productive workloads associated with the Admiral Nimitz galley operation for both the NWR SAM and AFM. To support the assessment of the workloads associated with each menu, each galley work task was clearly defined in terms of the specific included or covered work activities. For example, the food preparation task included several work activities that are not typically considered food preparation, but are directly impacted by a change in the mix of from-scratch, speed-scratch, and advance food items. Examples of these activities include: obtain required ingredients; obtain required clean pots, pans, and utensils; and transfer used pots, pans, and utensils to scullery for cleaning. These types of work activities typically are associated with from-scratch preparation, and were often eliminated or significantly reduced with the AFM. Therefore, the workload data collection of such activities was included under the food preparation task.

For the galley workload data collection, there were 18 defined productive work tasks to include 10 CS work tasks, 1 combined CS/base facilities personnel work task, and 7 FSA work tasks. In addition there was 1 non-productive CS and 1 non-productive FSA task to record CS and FSA personnel who were categorized as being non-productive when initially observed during each data collection galley walk through.

Six complete days (Tuesday through Sunday) of day watch workload data were collected to assess the galley workloads associated with each menu. Data were not collected for the galley night watch (Sunday through Thursday) operations. The workload data collection covered the galley day watch work schedule from start to finish. Work sampling observations were made every 15 minutes (i.e., on the hour, half-hour, and both quarter-hours). At each time point, the data collector conducted a galley walk through of all primary work areas inside the galley, but not office spaces and break rooms. During each walk through, the data collector categorized each observed CS or FSA worker as productive or non-productive based on what he/she was doing when first observed. If productive, the observed CS or FSA worker was then recorded under the work task that best covered the observed work activity. As these assessments were made, the number of observed CS or FSA workers performing each task was recorded on the data collection sheet. Based on this data, the productive galley work hours for each work task was estimated by multiplying the number of observed CS or FSA workers recorded for each work task by the observation interval, i.e., quarter hour. The work sampling data collection covered all productive work activities inside the galley except for offices and break rooms and all productive work activities on outside back dock areas and bulk store rooms for receiving and storing bulk supplies and transporting, processing, or disposal of galley generated waste.

CS productive work activities and associated workloads not reflected in the collection workload data include: all galley night watch work activities; galley office area productive work activities to include supervisory personnel office work activities, meetings, galley recordkeeping by galley administrative staff, etc.; external meetings away from the galley; required off watch CS staff training or professional development; or any other work efforts outside the galley, e.g., delivering required paperwork or picking up required supplies, etc.



All observed CS and FSA productive work activities were categorized into 1 of a set of defined work task activities. Two separate tasks were utilized to capture and record observed non-productive CS and FSA workers during each data collection time point. These non-productive tasks were utilized to record and know how many total workers, productive or non-productive, were actually observed during each galley workload data collection walk through. During lower galley workload periods, e.g., between meals, the number of observed and recorded non-productive workers tended to be less than the actual number. This is because during these periods on-duty personnel (especially CS) tended to migrate to closed break rooms or outside break or rest areas not covered by the work sampling data collection. This is not important, as galley staffing levels are established based on overall galley workloads, peak galley workloads, and an allowance for an appropriate amount of official (meal periods and breaks) and unofficial non-productive time during unavoidable reduced work load periods.

### **3. Results and Discussions**

#### **3.1 Summary Comparison of the NWR SAM and AFM**

The Navy SAMs are developed by Navy region, and they all include a mix of from-scratch, speed-scratch, and advance food items. The NWR AFM included all 3 of those types, just in different proportions, fewer from-scratch items.

In assessing the workload impacts associated with the 2 different menus, there are various factors to consider. Three key factors include: the actual items in each menu, the starting product form of each menu item (advance food to from-scratch prepared), and the overall mix of from-scratch, speed-scratch, and advance food items in each menu. However, there are both higher labor and lower labor content from-scratch menu items. As a result, in assessing the workloads of 2 cyclic menus with different items, a menu with a lower mix of from-scratch items could potentially generate a higher overall workload than a menu with more from-scratch preparation. For example, from-scratch lasagna very likely generates a higher galley workload impact than from-scratch seasoned baked boneless chicken breasts. As a result, if frozen advance heat and serve lasagna in 1 menu replaced scratch prepared lasagna in the other menu, then the reduction in galley food prep work hours should be meaningful. However, if the advance food lasagna product replaced from-scratch prepared boneless chicken breasts, any food prep work hour savings are likely to be much lower. If the items in each menu are the same except for starting product form, then a menu with a significant reduction in from-scratch items should generate a measurable reduction in overall galley food preparation workloads.

To provide a better understanding of the assessed workload impacts associated with each menu during the actual workload data collection periods, Appendix A provides detailed data on the actual menus by day, meal period, and specific menu item during the workload data collection periods. Data provided for each menu item include the assigned menu item category (advance, speed-scratch, or from-scratch) plus additional details on each item's starting form and the associated galley preparation steps to provide a finished product for serving. The extra preparation details for each menu item are provided because the category terms from-scratch, speed-scratch, and advance food product do not have clear definitions and are open to different interpretations. These details help clarify how similar or different specific menu items were between menus, and they provide insight to the galley workload impacts of each item and into how the specific items were categorized.

For many menu items there is a continuum of potential options with different workload impacts from maximum workloads for 100% from-scratch preparation from all basic from-scratch ingredients to the most advanced food product options which only require direct placement on the serving line. Consequently, a single product form category like advance food could cover 2 or more different starting product forms with different work load impacts. An example is provided in Appendix A relative to apple pie. As a result the question is where to draw the line to separate menu item product forms into the categories from-scratch, speed-scratch, or advance food products. For this assessment, the breaks were generally made by menu category (e.g., entrées, desserts, etc.) and then applied consistently across all items within the category for all days covered by workload data collection.

Table 1 presents and compares the 2 menus in terms of mix of from-scratch, speed-scratch, and advance food products during the 6-day periods for which workload data were collected for each menu. This comparison is divided into 3 parts: (1) common items across all meal periods (breakfast, brunch, lunch, dinner), (2) breakfast and brunch-breakfast type meal component categories or menu items, and (3) lunch and dinner (plus brunch-lunch type) meal component categories or menu items. For each listed meal component category or menu item, Table 1 includes a brief description of the starting product forms associated with the from-scratch, speed-scratch, and advance food category designations. Appendix A provides 4 tables of detailed menu level data by individual menu item by meal period for each menu for each day covered by work sampling data collection. Those tables provide the basis for the summary level comparisons presented in Table 1.

As shown in the first part of Table 1, 3 menu item product categories were identical for both menus in all forms. These include: assorted breads, assorted beverages, and assorted individual fruits. For both menus by meal period, these categories were identical in terms of specific items, item selection/variety, and item starting product form (advance, speed-scratch, or from-scratch prepared).

The second part of Table 1 summarizes the comparison of breakfast (and brunch-breakfast type items) between the 2 menus. The actual breakfast items for both menus were very similar during the data collection periods with minor differences, mostly due to specific menu items not being in stock. In addition, the starting product forms for the actual menu items were also very similar for both menus with only small differences.

As shown in Table 1, the everyday breakfast meal egg products (omelets, eggs to order, and hard boiled eggs), bacon, second breakfast meat, potatoes, and assorted cereal items were identical for both menus in terms of starting product form mixes. The largest difference between the 2 menus for the breakfast meal was breakfast pastries, which were 100% commercial advance food ready-to-serve items with the AFM and 100% from-scratch with the SAM. However, the SAM from-scratch breakfast pastries were totally prepared by the night watch. Thus, the extra workload associated with from-scratch prep of breakfast pastries is not reflected in the workload data. As a result, the subsequent comparison of SAM and AFM food prep workload data under states the actual AFM food prep workload reduction benefits. For the breakfast meal period, the second biggest difference between menus was the mix of the pancake, waffle, or French toast item (1 item daily). With the AFM these items were 100% advance food products, but with the SAM they were 50% advance and 50% from-scratch. With the SAM the batter for the from-scratch items was prepared by the night watch, and the menu items were cooked on the serving line griddle while the CS workers were also serving. The next largest difference was the Grab-N-Go sandwich for the weekday breakfast meal. It was a 50% advance/50% from-scratch mix (2 days advance food and 2 days from-scratch) with the AFM, and a 25% advance/ 75% from-scratch mix (1 day advance food and 3 days scratch prepared) with the SAM. This difference is minor. The from-scratch Grab-N-Go sandwiches were also made, assembled, and wrapped by the night watch prior to the arrival of the day watch. As a result these workloads are also not reflected in the collected workload data. Other differences between the 2 breakfast menus were all very minor relative to any potential workload impacts.

**Table 1. Summary Comparison of Navy NWR Standard Ashore and Advance Food Pilot Menu**

Days	Meals	Menu Item	Brief Description of Product Forms	Navy Menu	
				Standard	Adv Food Pilot
			-----		
All	All	Assorted Bread	Commercial ready to use self serve products	Self serve	Same
All	All	Assorted Beverage - Milk, Coffee, Tea, Juice (B), Soft Drinks (L/D)	From bulk self serve dispensers - milk, coffee, tea (self make from hot water), juice (Bkft/Br), soft drinks (L/D), etc	Self serve	Same
All	All	Assorted Indiv Fresh Fruits	Bananas, apples, oranges, etc.	Self serve	Same
All	B/Br	Omelets/Eggs to Order	Scratch- from fresh eggs, cooked to order	100% Scratch	Same
All	B/Br	Hardboiled Eggs	Scratch- from fresh eggs	100% Scratch	Same
All	B/Br	Bacon Pre Cooked	Speed Scratch - precooked heat/serve product	100% Sp Scratch	Same
All	B/Br	Second Breakfast Meat - varies	Speed Scratch -precooked heat/serve product. Scratch - from raw/uncooked product	60% Sp Scratch 40% Scratch	Same
All	B/Br	Pancakes, Waffles, or Fr Toast (1 Item Daily)	Advance - premade frozen heat/serve product Scratch - galley prepared from dry ingredients.	40% Advance 60% Scratch	100% Advance
All	B/Br	Assorted Hot Cereals (1 item daily)	Advance - shelf make indiv. oatmeal packets. Scratch - bulk prepared and served.	33% Advance 67% Scratch	50% Advance 50% Scratch
All	B/Br	Potatoes	Speed Scratch - from commercial froz product Scratch -from fresh potatoes	83% Sp Scratch 17% Scratch	Same
All	B/Br	Assorted Breakfast Pastries	Advance - commercial ready to serve product Scratch - prepared from ingredients by galley night crew.	100% Scratch	100% Advance
All	B/Br	Assorted Cereal	Individual portion plastic bowls	Self serve	Same
M-F	B	Grab and Go Sandwich	Advance - frozen wrapped heat/serve sandwich. Scratch - galley assembled sandwich	25% Advance 75% Scratch	50% Advance 50% Scratch

**Table 1 (cont'd). Summary Comparison of Navy NWR Standard Ashore and Advance Food Pilot Menu**

Days	Meals	Menu Item	Brief Description of Product Forms	Navy Menu	
				Standard	Adv Food Pilot
M-F	L-SO	Deluxe Cheese Burger	Speed Scratch - from pre-cooked frozen burgers, heated and sandwiches assembled to order.	100% Sp Scratch	Same
M-F	L-SO	Baked Beans	Speed Scratch - canned baked beans with added "extras"	100% Sp Scratch	Same
M-F	L-SO	French Fried Potatoes	Speed Scratch - frozen cut fries, galley deep fried.	100% Sp Scratch	Same
M-F	L-SO	Sauteed Onions & Mushrooms	Scratch - fresh cut/sauteed onions plus canned mushrooms	100% Scratch	Same
Daily	L/D	Entrees	Advance - 100% pre-made heat/serve product Speed Scratch - from pre-cooked (e.g. meats) plus scratch ingredients. Scratch - prepared from all basic ingredients.	4% Advance 37% Sp Scratch 59% Scratch	24% Advance 38% Sp Scratch 38% Scratch
Daily	L/D	Starch Sides (Rice, Pasta, Potatoes)	Speed Scratch - from dry pasta/rice/mix without galley added ingredients, or frozen potato products. Scratch - from dry pasta, rice/mix with other galley prepared/added ingredients, or from fresh potatoes.	20% Sp Scratch 80% Scratch	67% Sp Scratch 33% Scratch
Daily	L/D	Vegetables	Speed Scratch - from frozen or canned product Scratch - from galley cut whole fresh vegetables	83% Sp Scratch 17% Scratch	Same
Daily	L/D	Soups	Advance - from frozen RTU heat/serve product. Speed Scratch - condensed canned product. Scratch - from basic ingredients.	0% Advance 8% Sp Scratch 92% Scratch	50% Advance 17% Sp Scratch 33% Scratch

**Table 1 (cont'd). Summary Comparison of Navy NWR Standard Ashore and Advance Food Pilot Menu**

Days	Meals	Menu Item	Brief Description of Product Forms	Navy Menu	
				Standard	Adv Food Pilot
Daily	L/D	Whidbey Salad Bar	Scratch - from whole FFV products washed, cut, sliced, diced by FSAs. Everyday salad bar items plus 1 variable day to day item.	100% Scratch	Same
Daily	L/D	Fruit Gelatin -Indiv Servings	Scratch - prepared by FSAs and portioned into individual cups.	100% Scratch	Same
Daily	L/D	Assorted Cookies	Speed Scratch - from frozen pre-cut cookie dough, panned/baked by night shift, wrapped/plated by day shift. Scratch - galley prepared from dry ingredients/mixes.	100% Scratch	100% Sp Scratch
Tu Th Sa Su	L/D	Assorted Pies	Speed Scratch - frozen commercial pies, galley baked, sliced, plated. Scratch - galley prepared from pie dough plus canned pie filling	100% Scratch	100% Sp Scratch
We Fr	L/D	Assorted Cakes	Advance - frozen whole commercial cakes, galley sliced and plated.	100% Scratch	100% Advance
Daily	L/D	Dinner Rolls	Scratch - galley prepared from dry ingredients. Advance - commercial product, warm, self serve	100% Advance	Same

The similarities between the actual breakfast meals for each menu, the menu differences discussed above, and the night watch prep efforts for several SAM from-scratch breakfast items prior to work sampling data collection, when taken all together, suggest that the collected day watch workload data for each menu would likely indicate similar breakfast time period productive work loads (5 AM to about 9:30 AM) for both menus.

The third section of Table 1 details a similar comparison of both menus for the lunch (to include brunch-lunch type items) and dinner meal periods. With each menu, the galley operated 1 main line daily for the lunch (or brunch) and dinner meal periods and, a separate weekday-only short order (SO) line for the lunch meal period. As shown by Table 1, the weekday SO line was the same for both menus and was mostly comprised of all speed-scratch menu items.

Excluding the lunch SO line, the last part of Table 1 summarizes the combined breakout of all daily lunch and dinner items across 10 different meal component categories (e.g., entrées, vegetables, soups, etc.) in terms of percent advance food items, speed-scratch items, and from-scratch items. In addition, a brief description of the starting advance, speed-scratch, and from-scratch product forms is provided for each meal component category.

As also shown in Table 1, for 4 lunch/dinner meal component categories (vegetables, Whidbey salad bar, fruit gelatins, and dinner rolls), there were no differences in the mix of advance, speed-scratch, and from-scratch items. For both menus, the Whidbey salad bar, individual fruit gelatins, and dinner roll items were exactly the same. For the vegetable meal component, the mix of speed-scratch and from-scratch items was the same for both menus, but there were some differences in the specific vegetable items between the menus.

For the other 6 meal component categories, the SAM had a higher mix of from-scratch menu items, with the largest difference being for dessert items to include cookies, fruit pies, and cakes. With the SAM, these menu items were 100% from-scratch. With the AFM, the assorted cookie and fruit pies were 100% categorized as speed-scratch, and the cakes were 100% advance foods. There is a continuum of potential starting product forms for dessert items. Therefore, for each of the dessert product categories, a brief description for the advance, speed-scratch, and from-scratch product forms is also provided to help clarify each category. For the other 3 meal component categories (entrées, starch sides, and soups), the AFM included a reduced mix of from-scratch items. For the AFM, the mix of from-scratch items as compared to the SAM was: for entrées, 38% versus 59%; for starch sides, 33% versus 80%; and for soups 33% versus 92%.

The AFM reduced mix of from-scratch menu items for selected lunch/dinner meal components, by itself, would suggest that the AFM galley food prep workload should be lower than standard menu food prep workload during the lunch and dinner meal periods. However, a complicating issue is that data collection for each menu covered different segments of the overall 21-day galley menu cycle. For the SAM the data collection period covered days 9 to 14 of the menu cycle, and for the AFM the data collection covered days 16 to 21. As a result, the collected work sampling data for each menu often reflects galley workload impacts for the preparation of totally different menu items (e.g., chicken afritada as compared to fried shrimp) in addition to workload impacts due to changes in starting product form for the exact same menu

item (e.g., from-scratch roast beef from uncooked product versus speed-scratch roast beef from pre-cooked product).

### **3.2 NWR AFM Pilot Food Costs**

For multiple reasons, many segments of the commercial food service industry are moving toward increased utilization of advance foods and speed-scratch prepared menu items. These reasons include: increased product availability, high consistent product quality across all feeding operations, lower labor costs resulting from potential for reduced staffing levels, etc. While advance food and speed-scratch products offer many potential benefits, the 1 disadvantage is the typical higher associated food costs as compared to from-scratch menu preparation.

Table 2 presents summary level Admiral Nimitz galley financial status and monthly food cost data for the duration of the NWR AFM pilot operation, 21 total months (July 2006 through March 2008). The Table 2 data were extracted from the galley's monthly prepared NAVSUP Form 1359, General Mess Summary Document. This document converts daily meals fed by meal period by day into earned galley ration credits and galley monthly food cost allowances based on various set food cost allowances per daily ration earned. For SAM galley operations, standard galley financial food cost goals are for actual galley food costs to be within 3% (plus or minus) of the galley's earned food cost allowance. For the NWR pilot AFM operation, this financial target was raised, and the galley was authorized an "extra" fixed food cost allotment on top of the standard earned food allowances.

As shown by Table 2, the galley's monthly food costs were almost always above and often much higher than the monthly food allowance target based on the standard allowed per ration cost factors. In 18 of the 21 months of the pilot, actual galley monthly food costs exceeded the within 3% target of earned galley food allowances for SAM operations with the extra monthly food costs ranging between 4% and 20% of the standard earned galley food allowance. As would be expected, the quarterly variability in extra food costs was lower due to the smoothing out of larger month-to-month variations. The extra food costs tended to be highest at the start and lowest at the end of the pilot operation. For the first 6 months, the extra cost average was about 14% higher as compared to about 8% for the last 6 months. The extra food costs for the final quarter of the pilot were the lowest and amounted to \$9,435, or just 4% above the standard earned food allowance. The extra food costs for the entire 21 months totaled \$174K, or about 10% above the earned allowance.



**Table 2. Advance Food Pilot Menu Galley Monthly Financial Report Summary**

Month	Galley Ration Credits	Galley Food Costs		Per Ration Cost Factors (\$)			Monthly Over (--) / Under (+)		Quarterly Over (--) / Under (+)	
		Earned	Actual	Allowed	Actual	Delta	\$\$\$	%	\$\$\$	%
July 06	10,065	\$88,747	\$96,599	8.82	9.60	0.78	\$7,852	9%	\$41,975	16%
Aug 06	10,317	\$90,855	\$107,482	8.81	10.42	1.61	\$16,627	18%		
Sept 06	9,715	\$85,659	\$103,155	8.82	10.62	1.80	\$17,496	20%		
Oct 06	10,255	\$90,550	\$104,052	8.83	10.15	1.32	\$13,502	15%	\$29,580	11%
Nov 06	9,898	\$87,456	\$92,825	8.84	9.38	0.54	\$5,369	6%		
Dec 06	9,179	\$81,233	\$91,942	8.85	10.02	1.17	\$10,709	13%		
Jan 07	10,285	\$91,182	\$88,872	8.87	8.64	-0.22	-\$2,310	-3%	\$23,465	9%
Feb 07	8,654	\$76,360	\$91,102	8.82	10.53	1.70	\$14,742	19%		
Mar 07	9,608	\$84,387	\$95,420	8.78	9.93	1.15	\$11,033	13%		
Apr 07	9,637	\$85,769	\$90,369	8.90	9.38	0.48	\$4,600	5%	\$31,139	11%
May 07	10,152	\$90,353	\$105,206	8.90	10.36	1.46	\$14,853	16%		
June 07	11,208	\$99,751	\$111,437	8.90	9.94	1.04	\$11,686	12%		
July 07	9,879	\$88,318	\$92,907	8.94	9.40	0.46	\$4,589	5%	\$11,088	4%
Aug 07	10,418	\$93,135	\$100,504	8.94	9.65	0.71	\$7,369	8%		
Sept 07	9,738	\$87,058	\$86,188	8.94	8.85	-0.09	-\$870	-1%		
Oct 07	10,202	\$91,614	\$95,250	8.98	9.34	0.36	\$3,636	4%	\$27,133	11%
Nov 07	9,436	\$85,289	\$96,153	9.04	10.19	1.15	\$10,864	13%		
Dec 07	7,680	\$69,805	\$82,438	9.09	10.73	1.64	\$12,633	18%		
Jan 08	8,679	\$85,357	\$83,988	9.83	9.68	-0.16	-\$1,369	-2%	\$9,435	4%
Feb 08	7,434	\$73,135	\$78,248	9.84	10.53	0.69	\$5,113	7%		
Mar 08	7,810	\$76,613	\$82,305	9.81	10.54	0.73	\$5,692	7%		
<b>ALL</b>	<b>200,249</b>	<b>1,802,627</b>	<b>1,976,442</b>	<b>9.00</b>	<b>9.87</b>	<b>0.87</b>	<b>\$173,815</b>	<b>10%</b>	<b>---</b>	<b>----</b>

### 3.3 Galley Meals Planned and Served During Workload Data Collection

Two key factors that impact overall galley workloads for many work tasks are the number of meals planned (and prepared) and the number actually served. Some tasks are more impacted by the planned meal counts, some are more impacted by actual meal period headcounts, and others are not highly impacted by either. For example, galley food prep workload is highly impacted by the number of meals planned/prepared (whether served or discarded). Also the workload for a galley prepping food for 500 patrons will be higher than that for the same galley prepping and serving only 250 patrons. However, the food prep workloads are not generally directly proportional. The food prep hours to support 500 patrons is generally higher than but very likely less than 2 times that for 250 patrons. Other tasks, such as dinnerware sanitation, are not linked to meals planned/prepared. Dinnerware sanitation is linked to the number of meals served and the resulting number of trays requiring breakdown, sanitation, and return to the serving line for the next meal period. Still other tasks, such as staff/monitor check-in station, are not directly linked or impacted by meals planned or meals served. Galley workloads for staff/monitor check-in station may be very similar whether preparing/serving 500 or 250 patrons per meal period.

To facilitate direct comparisons (without data scaling) between the collected workload data for each menu, the data collection period for each menu was selected to target dates that would likely result in similar planned and actual daily meal headcounts during the workload data collection periods for the SAM and AFM. Galley headcount patterns tend to vary according to the day of the week and actual calendar day relative to pay days (1st and 15th). Over the days of the week, galley actual meal headcounts tend to be higher Monday through Thursday and lower Friday through Sunday. Relative to pay day, galley headcounts tend to drop on pay day and increase as the next pay day approaches. For these reasons the selected workload data collection periods for both menus covered the same 6 days of the week (Tuesday through Sunday), and the period for both menus started shortly after pay day (March 18 for AFM and June 3 for the SAM).

Table 3 details the average predicted daily meals and rations for each menu and the actual total daily meals served and rations earned by the 4 weekdays, the 2 weekend days, and all 6 days combined.

As shown in Table 3, the predicted total average daily meals and ration credits by weekdays, weekend days, and across all days were relatively similar for each menu. Table 3 data cover all galley meal periods except the night meal, provided Sunday through Thursday.

Appendix B (Table B-10 for the AFM and Table B-11 for the SAM) provides more detail data on the planned and actual meal headcounts for each meal period covered by the work sampling data collection.

Across all 6 days, the number of planned or predicted average total daily meals served for the AFM (659) was 4% higher than the number for the SAM (635). However, the actual daily average total meals served for the AFM (589) was 12% lower than for the SAM (672). The average daily meals actually served for the AFM was 9% lower than planned, while the actual was 9% higher than planned for the SAM. The average planned and actual daily meal counts

combined was slightly lower for the AFM, 96% (average of 104% + 88%) of those for the SAM. These small differences suggest the collected workload data for each menu can likely be directly compared with no real need for adjustments or scaling.

**Table 3. By Menu Predicted and Actual Galley Headcount Data During Worksampling Data Collection Periods**

Data Collection Cycle		Predicted <sup>1</sup>		Actuals <sup>1</sup>		Actual to Predicted Ratios
Menu	Days of Week	Total Meals	Rations Credits	Total Meals	Rations Credits	
Advance Food Menu (18-23 March)	Tue-Fri (4)	805	286	686	245	86%
	Sat -Sun (2)	367	178	394	192	108%
	All (6)	659	250	589	228	91%
Standard Ashore Menu (3-8 June)	Tue-Fri (4)	765	268	750	265	99%
	Sat -Sun (2)	376	182	515	250	137%
	All (6)	635	239	672	260	109%
Advance to Standard Menu Ratio	Tue-Fri (4)	105%	107%	92%	92%	----
	Sat -Sun (2)	98%	98%	76%	77%	----
	All (6)	104%	104%	88%	88%	----

<sup>1</sup> Covers all meals except night meals (Sun to Thur only) which averaged about 30.

### 3.4 AFM and SAM Galley Workloads

Based on the collected work sampling data, Table 4 presents the observed average daily galley work hours by work task for the 4 weekdays, the 2 weekend days, and all 6 days for each menu. The weekday and weekend results are detailed separately due to differences in galley weekday and weekend operations. For weekdays, day watch operations covered 3 meal periods (breakfast, lunch, and dinner), the day watch shift started at 5 AM, a night watch (Sunday through Thursday only) prepared some of the Monday to Friday menu items for the arriving day shift, and average patron meal counts were higher than on weekends. In comparison, weekend operations covered only 2 meal periods (brunch and dinner) per day, the day watch start time was delayed to 7 AM, there was no night watch to prep day watch brunch or dinner menu items, and the average patron meal count per meal period was lower.

As shown in Table 4, across all work tasks and all 6 days of data, the average total daily productive CS work hours for the AFM were slightly lower (61.3 to 63.1) than for the SAM, and the average total daily productive FSA work hours were also slightly lower (55.9 to 58.5) for the AFM. The assessed AFM galley workload reductions based on the collected data are not significant, are smaller than expected, and combined equate to less than 1 full time galley worker position. However, although the CS work hours were similar for all 6 days, the hours for the 2 weekend days were definitively lower for the AFM (39.9 vs. 52.4). They were offset by a slightly higher total for the 4 weekdays (72.1 vs. 68.4).

**Table 4. Comparison of Average Daily Galley Work Hours by Menu and Task**

Work Task <sup>1</sup>	Week Days (4)		Week End Days (2)		All Days (6)	
	Advance Menu	Standard Menu	Advance Menu	Standard Menu	Advance Menu	Standard Menu
CS-Check-In Station	11.8	11.3	7.3	6.1	10.3	9.6
CS-Supply (JODs)	2.0	3.8	0.0	0.0	1.3	2.5
CS-Galley Supervision	1.3	1.5	0.6	0.5	1.1	1.2
CS-Galley Records	2.6	1.1	0.5	0.1	1.9	0.8
CS-Food Store Area Wk	0.6	0.5	0.4	0.0	0.5	0.3
CS-Cook/Prep Food**	21.2	21.6	14.3	21.1	18.9	21.4
CS- Kitch Equip Sanit*	2.7	2.7	0.8	3.8	2.0	3.0
CS-Kitch Area Sanit	0.9	2.3	0.8	2.8	0.9	2.5
CS-Serving	21.8	18.5	13.9	15.4	19.2	17.5
CS-Other Productive	2.4	3.1	1.5	2.6	2.1	2.9
Equipment Repair/Maint*	4.9	2.1	0.0	0.0	3.3	1.4
FSA-FFV Prep*	11.8	12.6	7.4	8.0	10.3	11.1
FSA-Salad/Fruit Bars	3.5	3.8	2.3	4.1	3.1	3.9
FSA-Serving Lines	12.5	9.7	6.8	7.5	10.6	9.0
FSA-Pots/Pans**	8.6	8.8	5.3	6.5	7.5	8.0
FSA-Dinnerware Sanit	16.8	19.4	10.5	14.5	14.7	17.8
FSA-Dining/Serv Areas	9.9	7.5	4.1	4.1	8.0	6.4
FSA Other Productive	2.6	2.9	0.3	1.4	1.8	2.4
<b>Productive Work Hours</b>						
CS	72.1	68.4	39.9	52.4	61.3	63.1
FSA	65.6	64.8	36.5	46.1	55.9	58.5
Total	137.7	133.2	76.4	98.5	117.3	121.6
<b>Non Productive Hours</b>						
CS	23.8	18.8	14.5	7.1	20.7	14.9
FSA	12.2	13.7	14.1	13.6	12.8	13.7
Total Non Productive	36.0	32.5	28.6	20.8	33.5	28.6
<b>Non Productive Rate</b>						
CS	25%	22%	27%	12%	25%	19%
FSA	16%	17%	28%	23%	19%	19%
Overall	21%	20%	27%	17%	22%	19%

<sup>1</sup> By worker category, tasks with 1 or 2 asterisks was expected to show reduced work hours with the Advance Food Menu with the largest reduction for the task with two asterisks.

Prior to the start of data collection, the AFM was expected to reduce galley workloads for certain tasks, but not for all tasks. The AFM was expected to potentially reduce the workloads for just 5 of the 18 tasks, with no expected workload impacts for the other 13 tasks. The largest AFM

workload reduction was expected for the CS cooking/food preparation task and the FSA pot and pan sanitation work task. Smaller potential AFM workload reductions were expected for the CS kitchen equipment sanitation task, the galley equipment repair and maintenance task, and the FSA FF&V preparation task. Based on this expectation, any differences in the workload data for these tasks are attributable to normal day-to-day variations in galley workloads or other factors; they are not linked or associated with any difference in the mix of from-scratch, speed-scratch, and AFM items between the 2 menus.

The data results for the 5 galley work tasks for which the AFM was expected to potentially result in reduced galley workloads are discussed in the following subsections.

**3.4.1 CS-Cooking/Food Preparation.** The largest AFM workload reduction was expected to accrue for this CS galley work task. As detailed in Table 4, the average AFM work hours for this task were similar but slightly lower (2%) during the 4 weekdays (21.2 vs. 21.6), a significant 33% lower for the 2 weekend days (14.3 vs. 21.1), and about 12% lower across all 6 days (18.9 vs. 21.4) of data collection. Overall the collected workload data revealed smaller average AFM weekday workload reductions for this task than expected. There are multiple potential explanations for this data result.

One key reason is that the workload data collection for the 2 menus covered different 6-day periods during the overall 21-day cyclic menu: days 16 through 21 for the AFM and days 9 through 14 for the SAM. While the day-to-day breakfast item selections were very similar across all menu days, the day-to-day offerings for the lunch and dinner meal periods were often very different. As a result the workload data collected for each menu often covered totally different menu items (e.g., lasagna with 1 menu versus boneless chicken breast for the other menu) with potentially very different cooking/food prep workloads, especially if from-scratch prepared. As a result, by simple chance, the AFM weekday data collection period may have covered menu days that had higher than average cooking/food preparation workloads, while the SAM data collection period may have covered menu days that had lower than average cooking/food preparation workloads.

A second explanation is that the night watch clearly completed more of the incoming day watch's food prep workload during the weekday SAM period than they did during the weekday AFM period, and data were not collected for work performed by the night watch. The night watch performed more prep work during the SAM period because the SAM contained more from-scratch items than did the AFM. There was no night watch before the day watch on the weekends. The net effect is an underestimate of overall AFM food prep workload reduction benefits and an even greater underestimate for the weekdays.

A third potential explanation is the statistical basis of the work sampling data collection methodology, which results in a point estimate of the most likely galley workload with some margin of error or uncertainty (e.g., plus or minus 5%) rather than a precise measure of exact actual galley workload.

**3.4.2 CS-Equipment Sanitation.** CS workloads for this task were expected to be low for both menus and possibly slightly lower for the AFM due to reduced from-scratch menu

preparation and the resulting reduced usage of galley equipment (e.g., kettles) that requires sanitation after usage. Average work hours for this task across the 4 weekdays were 2.7 for each menu. For the 2 weekend days, the average AFM work hours were 79% lower at 0.8, compared to 3.8. Across all 6 days of data, the average AFM equipment sanitation work hours were 2.0 for the AFM, versus 3.0 for the SAM. In brief, the weekday differences were smaller than expected and the weekend results larger than expected. These results are likely attributable to the differences in specific menu items prepared each day and associated normal day-to-day variability. The average results across all 6 days for each menu appear reasonable.

**3.4.3 Equipment Repair and Maintenance.** Most of the observed workload for this task was performed by base installation maintenance personnel, with the remaining work performed by CS. (All of the work covered by each of the other tasks was performed by either CS or FSA personnel.) Based on the prior New London Advance Food Pilot results, average daily galley workloads for this task were also expected to be low for both menus and slightly lower for the AFM due to the decreased cooking equipment usage associated. However, the collected data revealed higher weekday workloads for AFM than for the SAM (4.9 versus 2.1) rather than the expected lower workloads. The unexpected task workload is entirely explainable. During the AFM data collection period, the NAS Whidbey Island galley was in competition for and prepping for an inspection associated with a Navy galley awards program. As a result, the unexpected extra workload for this task is attributable to the galley's prepping for the scheduled galley inspection and not to impacts associated with AFM changes.

**3.4.4 FSA-FF&V Preparation.** The AFM was also expected to perhaps result in slightly lower workloads for this task due to: decreased usage of FF&V items on the main hot line (e.g., fresh steamed broccoli, from-scratch prepared home fries, etc) and reduced preparation of FF&V items for galley from-scratch prepared soups. Only a slight reduction was expected because most of the workload for this task is related to the preparation of products for the Whidbey salad bar, which was exactly the same with both menus. The salad bar produce items were prepared from bulk produce requiring FSA washing, slicing, chopping, dicing, etc. As presented in Table 4, the AFM average daily work hours for this task were about 7% lower at 10.3 than the 11.2 for the SAM. These results appear reasonable based on actual menu items during the data collection periods. The 2 menus included the same mix of from-scratch prepared lunch/dinner vegetable items (17%), but the SAM had higher mixes of from-scratch prepared potato type menu items and soups.

**3.4.5 FSA-Pot/Pan Sanitation.** The AFM was expected to reduce FSA pot and pan sanitation workloads due to likely reduced pot and pan utilization associated with reduced from-scratch menu item preparation. As shown in Table 4, the AFM observed average daily workloads were quite similar but slightly lower during weekdays (8.6 to 8.8), during weekend days (5.3 to 6.5), and across all days (7.5 to 8.0). However during the AFM workload data collection, the galley's pot and pan sanitation center was undergoing a total overhaul and was not available. As a result, galley pots and pans were washed and rinsed in the bake shop sinks, and some large items were then transported to the dish room for the final sanitation step prior to transport back to the galley and placement into storage for subsequent use. As a result, AFM pot and pan workloads increased and were higher than they would have been if the regular pot and pan wash room was operational. During the SAM workload data collection, the renovated galley

pot and pan wash room was operational. Thus actual workload reduction benefits associated with the AFM are likely higher than that reflected by the actual collected data.

**3.4.6 Tasks with No Expected Differences Between Menus.** As previously mentioned, there was no basis to expect any difference between the 2 menus in the daily galley workloads for the other 13 productive work tasks. Therefore any measured differences for these tasks based on the actual data results are not linked to differences between the 2 menus, but instead are attributed to normal day-to-day variability in galley workloads due to various other factors or the margin of uncertainty or potential error (i.e., plus/minus 5%) associated with statistical sampling nature of workload data collection.

There were 8 CS work tasks for which average daily galley workloads were expected to be similar for both menus. These included: check-in station, supply, galley supervision, galley records, food storage area work, kitchen area sanitation, serving, and other productive.

As shown in Table 4, the average CS daily check-in-station work hours were similar (within 1 hour) with both menus for weekdays, weekend days, and all 6 days. This was expected, as the meal period serving hours and associated required check-in station staffing hours were the same with both menus.

The CS supply task only covered physical work efforts expended by the 2 CS workers, jack-of-the-dusts (JODs), assigned to the separate supply section watch that was staffed Monday through Friday only. The assessed productive work hours for this work task may appear very low, but the task only covered physical storeroom activities (e.g., receipt/storage, item breakout, etc.) and excluded all paperwork and administrative type activities within the supply office. The observed average daily work hours were only 2.0 for the AFM as compared to 3.8 for the SAM. However, there was no basis/rationale to expect any difference in workload results between the 2 menus. The assessed differences based on the collected data are likely attributable to other factors such as: periodic (not daily) physical inventory counts, periodic (not daily) rearrangement of inventory stocks that occurred by chance during AFM but not SAM data collection, normal day-to-day task workload variations, or the statistical sampling nature of workload data collection. As a result, the best estimate for the average daily workload for this task for each menu is 2.9 hours, i.e., the average of the 2.0 and 3.8 results for each menu.

The observed average daily work hours for the CS galley supervision task as expected were low and almost the same with each menu (1.1 AFM and 1.2 SAM), as galley office areas were excluded from workload data collection. This task only covered/reflects observed Galley chief, leading petty officer (LPO), galley supervisor, and watch captain supervisory related activities in the direct galley work areas (e.g., kitchen, serving line area, dining area, bake shop area, etc.). As a result, these results exclude and do not reflect any of the supervisory and administrative activities performed by supervisory personnel within office areas.

For the other 5 CS work tasks (galley records, food storage area work, kitchen area sanitation, serving, and other productive), differences between the 2 menus in average daily work hours by task ranged from 0.2 to 1.7. The combined overall workloads for all 5 tasks for each menu were very similar: 24.6 hours for the AFM and 24.0 hours for the SAM.

Similarly there were 5 FSA work tasks for which no difference in workloads was expected between the 2 menus. These included: salad/fruit bars, serving lines, dinnerware sanitation, dining/serving area, and other productive. The average daily workloads by task varied by 0.6 to 3.1 work hours between menus. However, the overall workload for all 5 FSA tasks for each menu was quite similar: 38.2 for the AFM and 39.5 for the SAM.

### **3.5 Total Productive Work Hours by Menu and Hour of Day**

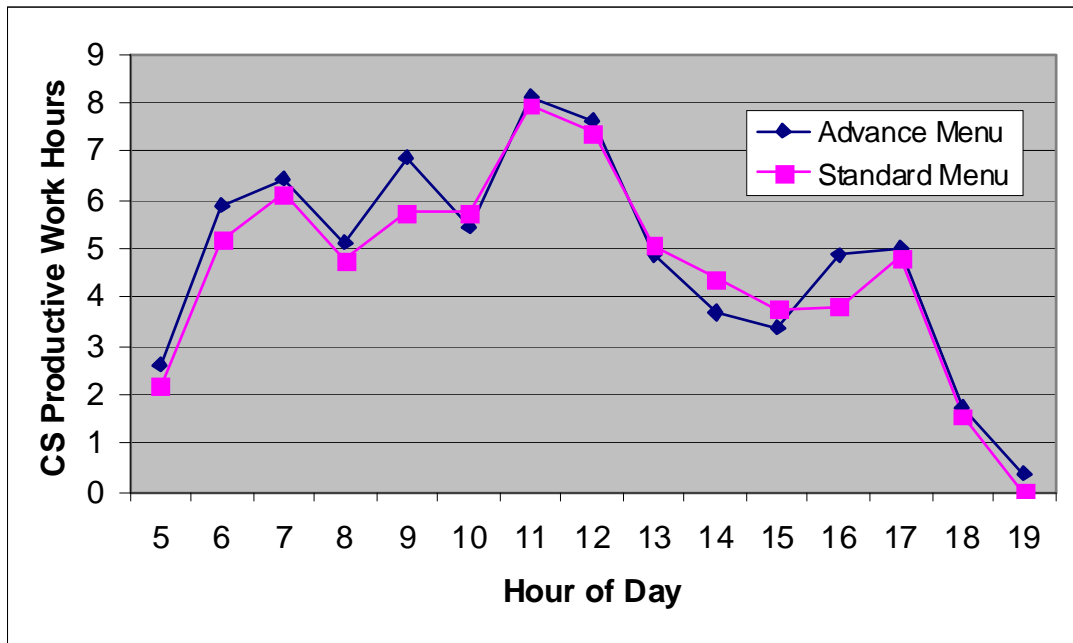
Two galley workload parameters primarily drive overall required galley staffing levels: (1) total daily productive workloads (i.e., work hours) and (2) peak galley workloads. These levels can be separated into 3 categories: CS workloads, FSA workloads, and combined CS and FSA workloads. The observed average daily workloads for each of the 3 categories were all slightly lower with the AFM. The combined CS and FSA average daily (all 6 days) productive work hours for the AFM was 4.4 lower than for the SAM. This equates to less than 1 full-time equivalent galley position. Peak galley workloads is a meaningful statistic because, even if 2 menus generate very similar total overall galley workloads, 1 of the menus can still generate reductions in galley staffing levels if it generates lower peak galley workloads requiring staffing coverage.

Figures 1, 2, and 3 depict the average galley weekday productive work hours for CSs, FSAs, and CSs and FSAs combined, respectively, by hour of the day. The weekday data are presented because of the higher overall daily galley workloads on weekdays than on weekends, resulting from an additional meal period each day and higher average daily patron meal counts. All the detailed data for both menus to include average weekend day galley workloads by work task by hour of the day are provided in Appendix B.

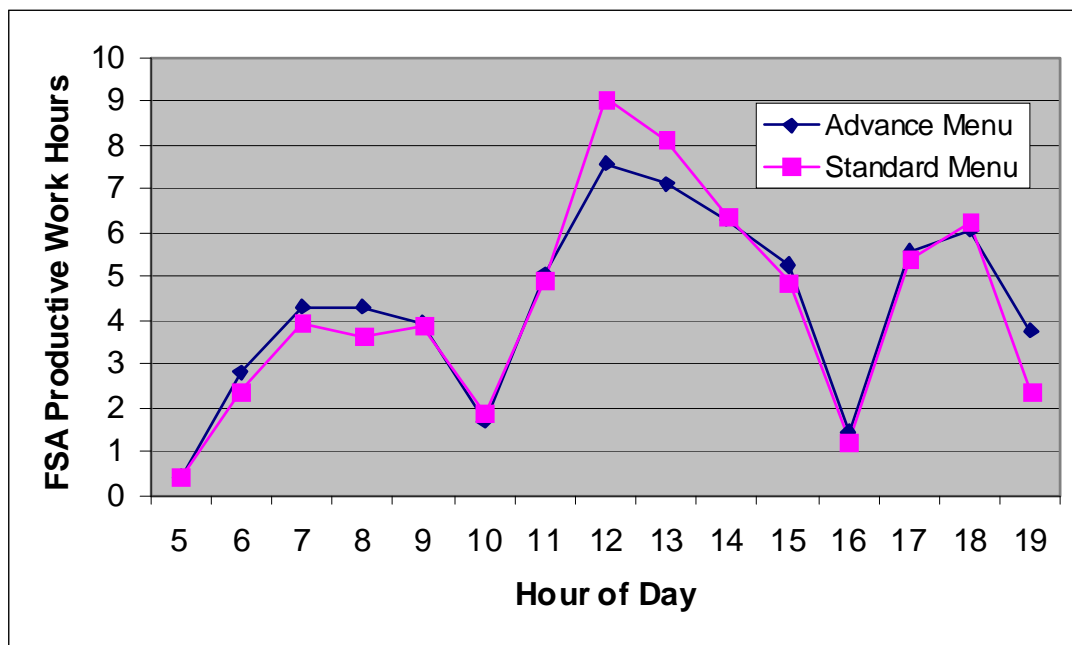
As shown in Figures 1, 2, and 3, the average daily galley weekday productive workloads for all 3 categories were very similar for each menu throughout the day watch work day, from 5 AM to the completion of work activities between 7 PM and 8 PM each weekday. Relative to average CS workloads, the maximum difference between the 2 menus was about 1 productive work hour during the 9 AM and 3 PM clock hours, while for FSA workloads the maximum difference was about 1.5 work hours during the noon and 7 PM work hours. Relative to the combined CS and FSA workloads, the maximum differences between the 2 menus for any clock hour were 1 to 1.5 work hours, with the combined maximum CS and FSA workloads being slightly higher for the SAM during the peak lunchtime meal period.

However as with the analysis of workloads by task for each menu, the differences in average galley workloads by worker category by hour of the day are all relatively minor with no indication of significant differences other than the normal day-to-day variability and differences in the menu cycle days.

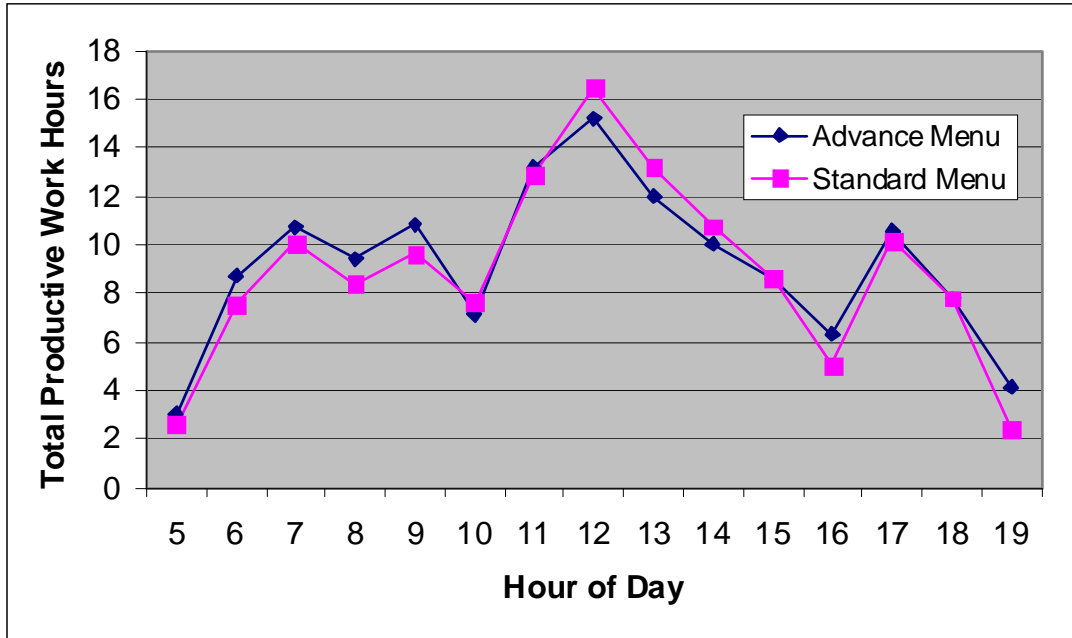




**Figure 1. Average Week Day CS Productive Work Hours by Menu**



**Figure 2. Average Week Day FSA Productive Work Hours by Menu**



**Figure 3. Average Week Day Galley Productive Work Hours by Menu**

### **3.6 Advance Food Pilot Operating Cost Impacts - Food Plus Labor**

Based on prior total system cost analysis of various military feeding systems, food and labor alone account for a very significant portion (90%) of total operational costs. For the AFM, the cost trade-off is higher total food costs due to an increased mix of more expensive advance food and speed-scratch items for potentially reduced galley workloads and associated staffing levels and labor costs.

For the actual NWR pilot AFM operations, some of the assigned Admiral Nimitz CSs were removed from the galley and assigned to other duties outside the galley. No changes were made to the installation FSA support contract. Neither of these impact the trade-off assessment of food and labor cost between the 2 menus, as required galley staffing costs are derived based on the collected work sampling data, the associated observed productive workloads, and the resulting required staffing levels to cover the measured workloads. For example, there will be more observed non-productive work hours if a galley is overstaffed during the work data collection period, and there will be fewer unproductive work hours and perhaps even a longer work day if the galley is understaffed.

## 4. Conclusions

### 4.1 Galley Workloads

The NWR pilot AFM increased mix of advance and speed-scratch food items was designed to reduce galley food preparation workloads with potential smaller workload benefits in FF&V preparation, kitchen equipment sanitation, and pot and pan sanitation. Based on 6 complete days of galley day watch workload data for each menu, the average overall daily galley workload reduction benefits associated with the AFM were relatively minor: 1.8 CS work hours per day and 2.6 FSA work hours per day, for a total of 4.4 work hours. The AFM average daily CS food preparation work was reduced by only about 2% or 0.4 hours (21.6 to 21.2) for the 4 weekdays, but was reduced by a meaningful 32% or 6.8 hours (21.1 to 14.3) for the 2 weekend days. The average reduction was 12% or 2.5 hours (21.4 to 18.9) across all 6 days. The assessed weekday (and resulting overall) food preparation workload reduction was smaller than expected. However, actual AFM food preparation workload reduction benefits are very likely larger than that reflected by the collected data for 2 primary reasons:

- Some of the advance food items on the pilot AFM were not available during the week that the workload data were collected, requiring substitution of the higher labor from-scratch SAM items. Galley AFM workload data were collected during the final month of the NWR pilot operations, just 2 weeks prior to the galley's planned total conversion back to SAM operations. As a result, some of the AFM items were no longer in-stock as part of its transition back to the SAM. One prime example was the One National Stock Number (1-NSN) meals (all advance food heat and serve items), which were part of the AFM for some lunch and dinner meal periods.
- The food prep work for some of the items on the SAM served during the 4 weekdays was not recorded. The galley night watch was not covered by workload data collection. The Sunday through Thursday galley night watch work schedule, coupled with the difference between AFM and SAM weekday and weekend day food prep workload results, strongly suggests that the night watch completed more of the day watch food prep workload for the SAM than they did for the AFM. The net effect of this is underestimation of actual SAM food prep workloads and, in turn, understatement of estimated AFM food preparation workload reduction benefits. One clear example is the from-scratch breakfast pastries included in the SAM. These items were prepared by the night watch and ready to serve with the arrival of the day watch, resulting in omission of this workload from the workload data. The breakfast pastries in the AFM were all commercial ready-to-serve advance food items involving no work effort. Because no night watch preceded the weekend day watch, the underestimated workload for the SAM occurred only on the weekdays, as the weekend day watch needed to completely prepare all of their menu items.

## **4.2 Food Cost and Labor Tradeoffs**

Based on both the actual AFM food costs during the entire NWR pilot operation and the 6 days of day watch workload data for both menus, the extra food costs were higher than the potential labor savings. As mentioned in Section 4.1, actual AFM galley workload reduction benefits are very likely larger than those reflected by the collected data. However, there is no means to reliably estimate these potential AFM workload reduction benefits.

## 5. Recommendations

Based on the assessment of NWR pilot AFM operations, the following recommendations are offered for any future Navy galley pilot AFM assessments:

- Collect data from baseline (pre-pilot) galley operations prior to conversions to and start of pilot galley operations.
- Collect data from pilot galley operations before the transition period back to standard galley operations begins, to ensure that all pilot menu items will be served during the data collection effort.
- Take measures to obtain clear and complete descriptions of baseline galley operations, planned pilot operational changes, and expected/potential impacts on comparing/assessing differences between the 2 galley operations. (Despite extensive discussions and surveys to collect data on differences between baseline and pilot galley operations – e.g., galley watch schedules, number of serving lines, meal period hours, etc. – there was no mention that the galley had a night watch. The NSRDEC assessment team did not become aware of the night watch until arrival at the NAS Whidbey Island for start of actual data collection. As a result, the night watch was not included in pilot data collection plans, thereby skewing the results.)

This document reports research undertaken at the U.S. Army Natick Soldier Research, Development and Engineering Center, Natick, MA, and has been assigned No. NATICK/TR- 09 / 018 in a series of reports approved for publication.

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## **Appendix A**

### **NAS Whidbey Island Actual Advance Food Pilot and Standard Ashore Menus During Work Sampling Data Collection Periods**

The Navy Northwest Region (NWR) Advance Food Pilot involved 3 ashore galleys. For the pilot operation these galleys utilized the Advance Food Menu (AFM). It included a larger mix of lower labor speed-scratch and advance food product menu items and reduced mix of from-scratch prepared menu items as compared to Standard Ashore Menu (SAM). The goal of the AFM was to reduce overall galley Culinary Specialist workloads.

To evaluate the potential galley workload reduction impacts associated with the AFM, the Navy Installation Command (NIC) requested the Natick Soldier Research, Development, and Engineering Center (NSRDEC) to conduct an independent galley workload and operational cost assessment of the NAS Whidbey Island Admiral Nimitz galley pilot operation with both the AFM and standard NWR ashore menu.

The Admiral Nimitz AFM pilot operation ran from 1 July 06 through 31 March 08 with a full conversion back to standard NWR ashore menu starting 1 April 2008. To assess the galley workloads associated with each menu, NSRDEC collected 6 consecutive days of galley day watch workload data (Tues through Sunday) for each menu. For the AFM, this data was collected during the period 18-23 March 2008, and for the standard NWR ashore menu during the period 3-8 June 2008.

The potential reduction in galley workloads through reduced from-scratch menu preparation is dependent on multiple factors. These include: the actual menu itself as there are higher and lower labor from-scratch prepared menu items; the difference in mix of from-scratch, speed-scratch, and advance food items in each menu; and the actual form of the speed-scratch or AFM items.

The galley workload to prepare/provide a specific menu item can vary significantly depending on whether it is 100% prepared from-scratch ingredients, a combination of from-scratch and partially prepared ingredients, or received as fully prepared cooked advance food product which only require reheating for items served hot, or simply opening of menu item cases prior to placement on the serving line.

To describe the level of work effort required to prepare and provide a specific menu item, the terms from-scratch, speed-scratch, and advance foods are often utilized. For example, 3 options for providing lasagna include: 100% galley prepared from-scratch ingredients to include galley prepared sauce (from-scratch preparation); prepared from commercial ready-to-use sauce plus other from-scratch ingredients (speed-scratch preparation); or received as a complete fully prepared cooked frozen product which only requires reheating prior to actual serving (advance food).

However for some menu items there are a continuum of potential options with different galley workload impacts depending on the starting form of each and every ingredient to the actual form of the menu item if received as a fully prepared advance food item requiring, at most, galley reheating and/or portioning prior to serving. Also, the terms from-scratch preparation, speed-scratch preparation, and advance foods while widely utilized do not have precise definitions and as a result are subject to open and varying interpretations between individuals and between menu item categories (e.g. entrées, desserts, starches, etc.).

As a result, to ensure reader clarity and understanding, to assess and compare 2 menus (AFM and SAM) in terms of similarities and/or differences in mix of from-scratch preparation, speed-scratch preparation, and use of advance food items, it is important to specify what each term implies or covers by specific menu item or menu item category.

Based on the above, 1 simple example is fruit pies which can be prepared or provided from the following 6 (plus other) different starting ingredient or product forms:

- 100% from-scratch prepared - from fresh fruit, crust ingredients, etc.
- Galley prepared - from pie filling, galley prepared crust, etc.
- Galley prepared - from pie filling, pre-made commercial pie crust, etc.
- Galley cooked - from frozen whole uncooked commercial pies
- Galley cut/served - from whole cooked ready-to-serve commercial pies
- Simply served - from commercial packaged ready-to-serve individual slices

With the above fruit pie example, the 6 listed options are from maximum galley workload (100% from-scratch prepared) to minimum galley workload impact (simply served). The first option or “100% from-scratch prepared” clearly represents from-scratch preparation as the end product is 100% galley prepared from 100% from-scratch ingredients. However, without clearer category definitions, some individuals could categorize the next 2 “galley prepared” options as from-scratch preparation and others could categorize them as speed-scratch preparation. Similarly for the “galley cooked” option, interpretations may vary and some may categorize this option as speed-scratch while others might categorize this option as an advance food product. All individuals would likely categorize the last 2 options or “galley cut/served” and “simply served” as advance food products. However, even with clear category definitions, each category (from-scratch preparation, speed-scratch, or advance food) can still include 2 or more different options each with a different galley workload impact.

For the above reasons, this appendix provides the complete details and specifics of the actual complete AFM and SAM provided by the galley by meal period and menu item during the time periods for which work sampling data were collected for each menu.



For each menu and days covered by work sampling data collection, the daily by meal period (Breakfast, Brunch, Lunch, Dinner) menu items were categorized as either common items across all days (e.g. assorted fresh breads and assorted beverages across all meal periods; deluxe cheeseburgers across all lunch meals; etc.), or as variable items that changed from day to day - for example lunch or dinner entrées. For the AFM, Table A-1 provides the details or specifics for the common menu items across days by meal period, and Table A-2 provides the specifics by day and meal period for the variable day to day items. Tables A-3 and A-4 provide similar details for the Standard Ashore Galley Menu during the days covered by work sampling data collection.

In each of these tables, for each listed menu item, the column label “Type Item” identifies if the menu item for menu comparison purposes was categorized as a from-scratch, speed-scratch, or advance food item. In addition, the next column labeled “Menu Item Starting Product Form...” provides additional details to the menu items actual starting ingredient or product form for better insight into associated galley workload impacts.

To facilitate a summary level comparison of the 2 menus in terms of mix of from-scratch, speed-scratch, and advance food products, separate criteria were set for each meal component (e.g. entrées, desserts, starch side, etc.) to determine whether a specific menu item should be categorized as a from-scratch, speed-scratch, or advance food item. The same criteria were then applied to both menus. This process resulted in each menu items classification as a from-scratch, speed-scratch, or advance food product as detailed in Tables A-1 to A-4.

The summary roll up of the detailed Table A-1 to A-4 by menu item categorization data provides the basis for the summary level comparison of the AFM and SAM by menu category in terms of mix of from-scratch, speed-scratch, and advance food products. The results of this roll up and resulting comparison is presented in Table 1 in the body of the report.

**Table A1. Advance Food Pilot Menu - Common Menu Items by Meal Period**

Days	Meals	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
All	All	X00012	Assorted Bread	Adv	Commercial products
All	All	X00900	Assorted Beverage	----	Juices(B), Soft Drinks (L/D), Coffee, Tea, etc
All	All	X01200	Assorted Fruits	---	Variety of Fruits
All	B/Br	Z00803	Assorted Omelets	Scr	From fresh eggs, cooked to order
All	B/Br	F00700	Griddle Fried Eggs	Scr	From fresh eggs, cooked to order
All	B/Br	F00400	Hardboiled Eggs	Scr	From fresh eggs
All	B/Br	L00101	Bacon Pre Cooked	SpScr	Commercial precooked product - heat/serve
All	B/Br	X00090	Assorted Breakfast Pastries	Adv	Commercial ready to serve product. Galley wrapped for self service.
All	B/Br	X00701	Assorted Cereal	Adv	Individual serving containers
M-F	L-SO	N01207	Deluxe Cheese Burger	SpScr	Pre-cooked frozen hamburgers -heat/serve
M-F	L-SO	Q00200	Baked Beans	SpScr	From canned baked beans with added "extras"
M-F	L-SO	Q04501	French Fried Potatoes	SpScr	From frozen cut French fries -galley deep fried.
M-F	L-SO	Q03001	Sauteed Onions & Mushrooms	Scr	From fresh cut onions plus canned mushrooms
All	L/D	D03300	Dinner Rolls	Adv	Commercial product
All	L/D	J00700	Fruit Gelatin -Indiv Servings	Scr	Prepared by FSAs and portioned into individual cups.
All	L/D	X00321	Whidbey Salad Bar	Scr	From whole FFV products washed, cut, sliced, diced by FSAs. Everyday items plus 1 variable day to day item -e.g. potato salad or Cole slaw.
All	L/D	X00092	Assorted Cookies	SpScr	From frozen pre-cut cookie dough- panned and baked by night shift and wrapped/plated by day shift.
Tu Th	L/D		Assorted Pies (Tu,Th,Sa, Su)	SpScr	Frozen uncooked commercial pies baked by night crew, cut/plated by day shift.
Sa Su	L/D		Assorted Cakes	Adv	Frozen commercial cake, thaw, slice, and plate
We Fr	L/D				

**Table A2. Advance Food Pilot Menu - Variable Menu Items by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
18-Mar	B	D02506	Waffles Frozen Brown & Serve	Adv	Premade frozen product - heat/serve
(Tues)	B	E00102	Hot Farina	Scr	Dry boxed mix - galley prepared and served
Day 16	B	X00718	Bkft Sandwich-Grab and Go	Scr	Prepared, assembled, wrapped by night crew
	B	L11001	Corn Beef Hash (Canned)	SpScr	Prepared canned product - just heat/serve
	B	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	L	E00500	Steamed Rice	SpScr	From dry product/mix
	L	L09900	Pork Adobo	Scr	Made from uncooked pork plus other scratch ingredients
	L	N04400	Grilled Chicken Breast Sandwich	SpScr	Used precooked frozen chicken breast filets. Chicken heated and assembled by galley into wrapped sandwiches.
	L	N05400	Deli Bar	Adv	Used pre-sliced deli meats and cheeses
	L	P00102	Beef Noodle Soup	Scr	Prepared from scratch ingredients
	L	Q12100	Spinach (Fz)	SpScr	From frozen product-cook/serve
	L	Q12700	Peas/Carrots (Fz)	SpScr	From frozen product-cook/serve
	L-SO	N03001	Frankfurters Steamed	Scr	Regular frozen hot dogs - boiled/steamed
	D	E00500	Steamed Rice	SpScr	From dry product/mix
	D	L11900	Baked Fish (Pollack)	Scr	From frozen uncooked fish filets - CSs prepared/added toppings, spices, etc.
	D	L83400	Swedish Meatballs (Precooked)	Adv/Scr	Precooked frozen meatballs w/o sauce. Sauce scratch prepared/added by CSs.
	D	N01207	Deluxe Cheeseburger	SpScr	Used pre-cooked frozen hamburgers -heat/serve
	D		N. E. Clam Chowder	Adv	Pre-made frozen boil in bag
	D	Q04503	French Fried Potatoes	SpScr	From frozen product-galley deep fried
	D		Beans Green Fz	SpScr	From frozen product-cook/serve
	D	Q12600	Mixed Vegetable Fz	SpScr	From frozen product-cook/serve

**Table A2 (cont'd) . Advance Food Pilot Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
19-Mar (Wed)	B	D81400	Pancakes Buttermilk	Adv	Premade frozen product -heat/serve
	B	E00100	Hot Oatmeal	Adv	Individual serving packets. Patrons add hot water.
Day 17	B	N00700	English Muffin w Bacon, Egg, Cheese	Adv	Premade frozen, heat and serve
	B	E00700	Pork Fried Rice (Oven Method)	SpScr	From pre-cooked pork plus other scratch ingredients.
	B	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	B	X00701	Tocino	Scr	Pre-made frozen raw product-cooked by CSs.
	L	D00700	Toasted Garlic Bread	Scr	From commercial French bread, galley added butter/garlic spread and toasted..
	L	E00800	Rice Pilaf	SpScr	From dry product/mix
	L	L02502	Lasagna Fz	Adv	Premade frozen -just heat/serve
	L	L19100	Chicken & Italian Vegetable Pasta	Scr	Complete scratch. Prepared from frozen raw chicken, frozen vegetables, and dry pasta.
	L	P00701	Minestrone (Fz)	Adv	Frozen boil in bag product
	L	Q10500	Broccoli Fz	SpScr	From frozen product-cook/serve
	L	Q11100	Corn on the Cob Fz	SpScr	From frozen product-cook/serve
	L	X20003	Potato Bar	Scr	Galley baked fresh potatoes plus pre-made toppings and fresh cut steamed broccoli.
L-SO		X00043	Assorted Pizza	Adv	Precooked frozen indiv size pizza -heat/serve
L		X20002	Ice Cream Bar	--	Patron self serve - 2 flavors w toppings
	D	E00700	Pork Fried Rice	Scr	Pork - pre-cooked and diced by CSs. Rice component - from dry mix.
	D	L18100	Chicken In Orange Sauce	Adv	Precooked frozen product -just heat/serve
	D	L84000	Blackened Fish (Use catfish)	Scr	From frozen thawed raw filets - galley prepared/seasoned/baked
	D	N01207	Deluxe Cheese Burger	SpScr	Used pre-cooked frozen hamburgers -heat/serve
	D	P00102	Beef Noodle Soup	Adv	Pre-made frozen boil in bag
	D	Q04501	French Fried Potatoes Fz	SpScr	From frozen cut French fries. Galley deep fried.
	D	Q07000	Garlic Roasted Potatoes	Scr	Prepared from fresh whole potatoes
	D	Q10600	Brussel Sprouts (Fz)	SpScr	From frozen product-cook/serve
	D	Q10900	Cauliflower (Fz)	SpScr	From frozen product-cook/serve

**Table A2 (cont'd) . Advance Food Pilot Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
20-Mar	B	D81300	French Toast, Cinnamon Swirl Fz	Adv	Premade frozen product -heat/serve
(Thur)	B	E00102	Hot Farina	Scr	Dry boxed mix - galley prepared and served
Day 18	B	X00718	Grab and Go Breakfast Burrito	Adv	Premade frozen heat and serve
	B	Q13700	Tater Tots	SpScr	Frozen product -galley deep fat fried
	B	X31000	Baked Chorizo	SpScr	Pre-cooked pre-seasoned heat and serve product.
	B	X32000	Tortilla	Adv	Frozen or refrigerated ready to use heat and serve product.
	L	D01503	Jalapeno Corn Bread (Corn Bread Mix)	Scr	From dry corn bread mix plus added ingredients - canned jalapenos, etc.
	L	E00900	Spanish Rice	Scr	Prepared from multiple different ingredients.
	L	L00300	Chicken Enchiladas	Adv	Premade frozen heat/serve enchiladas plus separate premade sauce added by CSs.
	L	N04900	Mexican Beef Wrap	Scr	From frozen raw product cooked by CSs and tortillas. Tortillas heated and wraps assembled by CSs.
	L	N05400	Deli Bar	SpScr	Pre-sliced deli meats and cheeses. Lettuce, tomato, onions sliced by galley.
	L	P00401	French Onion Soup	Scr	Scratch prepared from separate ingredients.
	L	Q03800	Refried Beans w Cheese	SpScr	Precooked canned item. Cheese topping added and heated.
	L	Q10002	Asparagus (Fresh)	Scr	From fresh product
	L-SO	N03001	Frankfurters Steamed	Scr	Frozen hot dogs - steamed
	D	E00502	Tossed Green Rice	Scr	From dry rice plus multiple other ingredients
	D	L01000	Beef Pot Roast	SpScr	Pre-cooked whole heat/serve pot roast sliced by CSs.
	D	L14901	Baked Chicken w Mushroom Gravy	SpScr	From pre-cooked frozen chicken plus CS scratch prepared mushroom gravy
	D	N01207	Deluxe Cheese burger	SpScr	Used pre-cooked frozen hamburgers -heat/serve
	D	P00201	Chicken Noodle Soup	Adv	Pre-made frozen boil in bag
	D	Q02001	French Fried Okra	SpScr	Breaded frozen product - galley deep fried
	D	Q04501	French Fried Potatoes (Fz)	SpScr	From frozen cut French fries. Galley deep fried.
	D	Q05100	Potatoes Au Gratin	Scr	Prepared from separate ingredients - fresh potatoes, cheeses, etc.
	D	Q10100	Beans Green Fz	SpScr	From frozen product-cook/serve

**Table A2 (cont'd) . Advance Food Pilot Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
21-Mar (Fri)	B	D02506	Waffles Brown & Serve	Adv	Premade frozen product - heat/serve
	B	E00100	Hot Oatmeal	Adv	Individual serving packets. Patrons add hot water.
Day 19	B	N00700	Bkft Sandwich-Grab and Go	Scr	Prepared, assembled, wrapped by night crew
	B	E00500	Steamed rice	Scr	From dry product
	B	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	B	X00115	Pork Loganisa	Scr	From uncooked product that is boiled then grilled.
	L	E00500	Steamed Rice	SpScr	From dry rice
	L	E01200	Noodles Jefferson	Scr	Prepared from dry egg noodles
	L	L25400	Grilled Salmon	Scr	Fully prepared by CSs from uncooked filets.
	L	P01200	Manhattan Clam Chowder	Scr	Prepared from scratch ingredients and canned clams
	L	Q00400	Italian Style Baked Beans	SpScr	From canned beans with CS added extras
	L	Q02500	Vegetable Stir fry	Scr	From galley sliced fresh vegetables.
	L	X00033	Chicken afritada	SpScr	Pre cooked frozen chicken plus remainder prepared by CSs from scratch ingredients
	L	X20004	Pasta Bar w Garlic Bread	Scr + SpScr	Pasta - from dry product. Sauces - commercial heat and serve products. No meats. Garlic bread - commercial French bread with galley added butter/garlic spread.
	L	X20002	Ice Cream Bar	---	Patron shelf serve
	D	N01207	Deluxe Cheese Burger	SpScr	Used pre-cooked frozen hamburgers -heat/serve
	D	Q04501	French Fried Potatoes (Fz)	SpScr	From frozen cut French fries. Galley deep fried.
	D	E00500	Steamed Rice	SpScr	From dry rice
	D	Q12400	Succotash	Scr	From frozen product-cook/serve
	D	Q01800	Cauliflower Au Gratin	Scr	Prepared from ingredients - frozen cauliflower, cheeses, etc.
	D	L08502	Pork Chops with Mushroom Gravy	Scr	From uncooked pork and CSs prepared gravy
	D	L12000	Baked Stuffed Fish	Adv	Ready to cook frozen stuffed Pollack product
	D	X00033	Chicken afritada	---	Leftovers from lunch meal
	D	P00200	Chicken rice soup	Scr	Prepared form scratch ingredients
	D	Q05700	Mashed Potatoes	SpScr	From instant potatoes

**Table A2 (cont'd) . Advance Food Pilot Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
22-Mar (Sat)	Br	D81300	French Toast	Adv	Premade frozen product -heat/serve
	Br	E00200	Hominy Grits	Scr	From dry mix - galley prepared.
	Br	Q04700	Home fried potatoes	Scr	From fresh potatoes
	Br	Q07100	Rosemary potatoes	Scr	From fresh potatoes. Oven roasted
	Br	Q10100	Green Beans	SpScr	From frozen product-cook/serve
	Br	X37000	Minute Steak	SpScr	From pre-cut thin sliced meat, galley grilled
	Br	N02800	Italian Beef Sandwich	SpScr	From precooked Philly Steak product - heated/assembled into sandwiches by CSs..
	Br	P01401	Cream Broccoli Soup	Adv	Pre-made frozen boil in bag product
	D	P02300	Split Pea Soup	Adv	Pre-made frozen boil in bag product.
	D	E00800	Rice Pilaf	SpScr	From dry product/mix
	D	L00700	Grilled Steak	Scr	Used uncooked frozen product.
	D	L14600	BBQ Chicken	SpScr	From pre-cooked chicken plus CS added pre-made ready to use BBQ sauce
	D	Q03001	Sauteed mushrooms & Onions	Scr	From fresh cut onions plus canned mushrooms
	D	Q04400	Baked Potato	Scr	Galley baked fresh potatoes
	D	Q12200	Summer Squash	SpScr	From frozen product-cook/serve
23-Mar (Sun)	Br	D81400	Pancakes Buttermilk	Adv	Premade frozen product -heat/serve
	Br	E00100	Hot Oatmeal	Adv	Individual serving packets. Patrons add hot water.
	Br	Q04501	French Fried Potatoes (Fz)	SpScr	From frozen cut French fries. Galley deep fried.
	Br	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	Br	X00102	Biscuits & Sausage Gravy	SpScr	Biscuits - commercial heat and serve product. Gravy - commercial canned heat and serve product.
	Br	N02702	BBQ Pork Sandwich	Adv	From pre-cooked pork frozen pork patties with BBQ sauce.
	Br	P00600	Tomato Soup	SpScr	From canned add water heat and serve product.
	Br	Q12700	Peas and Carrots	SpScr	From frozen product-cook/serve
	D	L00401	Steamship Round of Beef	Scr	From raw source product - galley cooked and sliced.
	D	L06900	Baked Ham	SpScr	Precooked ham, made/added glaze sauce
	D	L16100	Roast Turkey	Scr	From uncooked turkey
	D	E00800	Rice Pilaf	SpScr	From dry product/mix
	D	Q05700	Mashed Potatoes	SpScr	From instant potatoes
	D	P01400	Cream of Mushroom	SpScr	From canned add water heat and serve product.
	D	Q11600	Peas	SpScr	From frozen product-cook/serve

**Table A3. NWR Standard Ashore Menu - Common Menu Items by Meal Period**

Days	Meals	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
All	All	X00012	Assorted Bread	Adv	Commercial products
All	All	X00900	Assorted Beverage	----	Juices (B), Soft Drinks (L/D), Coffee, Tea, etc
All	All	X01200	Assorted Fruits	--	Variety of Fruits
All	B/Br	Z00803	Assorted Omelets	Scr	From fresh eggs, cooked to order
All	B/Br	F00700	Griddle Fried Eggs	Scr	From fresh eggs, cooked to order
All	B/Br	F00400	Hardboiled Eggs	Scr	From fresh eggs
All	B/Br	L00101	Bacon Pre Cooked	SpScr	Commercial precooked product - heat/serve
All	B/Br		Assorted Pastries	Scr	Prepared by night crew (M-F), and day crew for Saturday and Sunday
All	B/Br	E02401	Assorted Cereal	Adv	Individual bowls with peel lids
M-F	L-SO	N01207	Deluxe Cheese Burger	SpScr	Pre-cooked frozen hamburgers -heat/serve
M-F	L-SO	Q00200	Baked Beans	SpScr	From canned baked beans with added "extras"
M-F	L-SO	Q04501	French Fried Potatoes	SpScr	From frozen cut French fries -galley deep fried.
M-F	L-SO	Q03001	Sauteed Onions & Mushrooms	Scr	From fresh cut onions plus canned mushrooms
All	L/D	D03300	Dinner Rolls	Adv	Commercial product
All	L/D	J00700	Fruit Gelatin -Indiv Servings	Scr	Prepared by FSAs and portioned into individual cups.
All	L/D	X00321	Whidbey Salad Bar	Scr	From whole FFV products washed, cut, sliced, diced by FSAs. Everyday items plus 1 variable day to day item -e.g. potato salad or Cole slaw.
All	L/D		Assorted Cookies	Scr	From mix
All	L/D		Assorted Pies (Tu,Th,Sa, Su) and Cakes (We,Fr)	Scr	Pies prepared by galley from pie filling. Cakes made from dry mixes or ingredients.



**Table A4. NWR Standard Ashore Menu - Variable Menu Items by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
3-Jun	B	D02506	Waffles Frozen Brown & Serve	Adv	Premade frozen product - heat/serve
(Tues)	B	E00102	Hot Farina	Scr	Dry boxed mix - galley prepared and served
Day 9	B	X00718	Bkft Sandwich-Grab and Go	Scr	Prepared, assembled, wrapped by night crew
	B	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	B	Y11000	Corned Beef Hash	SpScr	Prepared canned product - just heat/serve
	L	F00100	Baked Macaroni and Cheese	Scr	Totally prepared from scratch ingredients
	L	L00500	Roast Beef	Scr	Started by night crew. From raw beef, seasoned, slow cooked.
	L	L12402	Fr Fried Fish Portions	SpScr	Pre-breaded raw fish, deep fried and served
	L	O01600	Brown Gravy	Scr	Prepared from ingredients
	L	P01401	Cream of Broccoli Soup	Scr	Prepared from ingredients
	L	Q01701	Glazed Carrots	SpScr	From frozen carrots plus galley added glaze
	L	Q10002	Brussel Sprouts	Scr	From fresh product
	L	Q05700	Mashed Potatoes	SpScr	From instant potatoes
	L	X20002	Ice Cream Bar	--	Patron self serve - 2 flavors w toppings
	L-SO	N03001	Frankfurters Steamed	Scr	Regular frozen hot dogs - boiled/steamed
	D	E00401	Buttered Pasta	Scr	From dry product, cooked in kettle
	D	L01200	Country Style Steak	SpScr	Pre-breaded frozen product, deep fried
	D	L15000	Turkey Pot Pie	Scr	From scratch ingredients -raw turkey, vegetables, plus prepared sauce
	D	P01301	New England Clam Chowder	Scr	From canned clams plus scratch ingredients
	D	Q05000	Oven Fried Potatoes	Scr	From whole fresh potatoes, cooked in kettle then seasoned and oven baked
	D	Q10500	Broccoli (Fz)	SpScr	From frozen product-cook/serve
	D	Q11000	Corn Whole Kernel (Fz)	SpScr	From frozen product-cook/serve

**Table A4 (cont'd). NWR Standard Ashore Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
4-Jun	B	D02500	Pancakes (Griddle Cakes)	Scr	Prepared from dry ingredients
(Wed)	B	E00100	Hot Oatmeal	Adv	Individual serving packets. Patrons add hot water.
Day 10	B	N00700	English Muffin w Bacon, Egg, Cheese	Scr	Prepared, assembled, wrapped by night crew
	B	E00700	Pork Fried rice	Scr	Prepared from dry rice plus scratch ingredients
	B	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	B	X00116	Tocino	Scr	Pre-made frozen raw product-cooked by CSs.
	L	D00700	Toasted Garlic Bread	Scr	From commercial French bread, galley added butter/garlic spread and toasted..
	L	L02502	Lasagna Frozen	Adv	Frozen heat/serve product 9 portions/container
	L	L05100	Chicken Parmesan	SpScr	Pre-breaded/cooked, galley deep fried, sauce and cheese toppings added.
	L	P00701	Minestrone Soup	Scr	From ingredients
	L	Q03300	Parsley buttered Potatoes	Scr	From fresh red potatoes
	L	Q10600	Brussel Sprouts (Fz)	SpScr	From frozen product -steamed
	L	Q12600	Mixed Vegetables (Fz)	SpScr	From frozen product -steamed
	L	X20003	Potato Bar	Scr	Galley baked fresh potatoes plus pre-made toppings and fresh cut steamed broccoli.
	L-SO	L16500	Pizza	Adv	Precooked frozen indiv pizza -heat/serve
	D	L04000	Stuffed Green Peppers	Scr	From fresh peppers plus ingredients
	D	L15500	Fried Chicken	SpScr	From frozen breaded product
	D	Q01602	Chicken or Turkey Gravy	Scr	From ingredients
	D		Minestrone	Scr	From beef stock, fresh vegetables, canned tomatoes
	D	Q01701	Glazed Carrots	SpScr	From frozen carrots plus galley added glaze
	D	Q02901	Southern Style Green Beans (Fz)	SpScr	From frozen product -steamed
	D	Q05000	Oven Browned Potatoes	Scr	From fresh potatoes

**Table A4 (cont'd). NWR Standard Ashore Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
5-Jun (Thur) Day 11	B	E00200	Hominy Grits	Scr	From dry mix - galley prepared.
	B	F01200	Breakfast Burrito	Adv	Frozen heat and serve
	B	Q13700	Tater Tots	SpScr	Frozen product -galley deep fat fried
	B	X31000	Baked Chorizo	SpScr	Pre-cooked pre-seasoned heat and serve product.
	B	X32000	Tortilla	Adv	Frozen or refrigerated ready to use heat and serve product.
	L	D01503	Jalapeno Corn Bread (Corn Bread Mix)	Scr	From dry corn bread mix plus added ingredients - canned jalapenos, etc.
	L	E01100	Mexican Rice	Scr	From dry rice plus ingredients
	L	L03400	Tacos (Ground Beef)	SpScr	Pre-cooked beef plus seasoning plus pre-made shells
	L	L22300	Line Chicken Tacos	Scr	Prepared from raw chicken plus ingredients, pre- made shells
	L	N05400	Deli Bar	SpScr	Pre-sliced deli meats and cheeses. Lettuce, tomato, onions sliced by galley.
	L	P02500	Texas Tortilla Soup	Scr	Prepared from ingredients
	L	Q01201	Calico Cabbage	Scr	From fresh cabbage plus ingredients.
	L	Q02702	Mexican Corn	SpScr	From canned corn, fresh diced peppers, other ingredients
	L	Q03801	Refried Beans (Canned)	SpScr	Precooked canned item. Seasoning and cheese added then heated.
	L-SO	N03001	Frankfurters Steamed	Scr	Frozen hot dogs - steamed
	D	E00500	Steamed Rice	SpScr	From dry rice
	D	L06200	Yakisoba (Beef & Spaghetti)	Scr	From dry noodles, beef knuckle, fresh vegetables
	D	P02300	Split Pea Soup	SpScr	Premade condensed canned, add water
	D	Q00800	Harvard Beets	SpScr	From canned beets plus other recipe ingredients
	D	Q05000	Oven Browned Potatoes	Scr	From fresh potatoes -sliced, seasoned, baked
	D	Q10002	Asparagus (Fresh)	Scr	From fresh product
	D	Z40000	Teriyaki Salmon	Scr	From uncooked portioned product. Galley prepared/added glaze.

**Table A4 (cont'd). NWR Standard Ashore Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
6-Jun	B	DD2506	Waffles Frozen Brown & Serve	Adv	Premade frozen product - heat/serve
(Fri)	B	E00102	Hot Farina	Scr	Dry boxed mix - galley prepared and served
Day 12	B	N00700	English Muffin w Bacon, Egg, Cheese	Scr	Prepared, assembled, wrapped by night crew
	B	E00500	Steamed Rice	Scr	From dry rice
	B	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	B	X00115	Pork Loganisa	Scr	From uncooked product that is boiled then grilled.
	L	E01000	Red Beans with Rice	Scr	From dry rice plus canned beans,
	L	L13702	French Fried Breaded Shrimp	SpScr	From breaded, frozen, raw, galley deep fried
	L	L15400	Creole chicken	Scr	From ready to cook chicken breast plus ingredients
	L	O01602	Chicken or Turkey Gravy	Scr	From chicken drippings/rue plus ingredients
	L	P00800	Navy Bean Soup	Scr	From scratch ingredients
	L	Q05700	Mashed Potatoes	SpScr	From instant potatoes
	L	Q10500	Broccoli (Frozen)	SpScr	From frozen product-cook/serve
	L	Q12600	Mixed Vegetable (Fz)	SpScr	From frozen product-cook/serve
	L	X20004	Pasta Bar w Garlic Bread	Scr + SpScr	Pasta - from dry product. Sauces - commercial heat and serve products. No meats. Garlic bread-commercial French bread with galley added butter/garlic spread.
	L-SO	L10904	Chicken Nuggets	SpScr	Precooked breaded. Galley deep fried.
	D	E80100	Wild Rice (Mix)	SpScr	From dry product/mix
	D	L01002	Yankee Pot Roast	SpScr	Precooked product, reheated, sliced
	D	L52400	White Fish with Mushrooms	Scr	From raw fish, galley seasoned and prepared white sauce
	D	O01800	Natural Pan Gravy (Au Jus)	Scr	Prepared from Pot Roast drippings
	D	P00201	Chicken noodle soup	Scr	
	D	Q01701	Glazed Carrots	SpScr	Frozen carrots plus galley prepared glaze
	D	Q05100	Potatoes Au Gratin	Scr	From fresh potatoes plus ingredients
	D	Q10100	Beans, Green (Frozen)	SpScr	From frozen product- cook/serve

**Table A4 (cont'd). NWR Standard Ashore Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
7-Jun (Sat) Day 13	Br	D02200	French Toast	Scr	From fresh eggs and fresh bread
	Br	E00200	Hominy Grits	Scr	From dry mix - galley prepared.
	Br	N02700	BBQ Beef Sandwich	SpScr	From pre-cut cooked meat plus added BBQ sauce
	Br	P00201	Chicken Noodle soup	Scr	From chicken base plus added ingredients
	Br	Q04100	Peas with Mushrooms (Frozen)	SpScr	Frozen peas plus added canned mushrooms
	Br	Q04700	Home Fried Potatoes	Scr	From fresh potatoes
	Br	Q07000	Garlic Roasted Potato Wedges	Scr	From fresh potatoes
	Br	X37000	Minute Steak	SpScr	Pre-cut thin sliced meat, galley grilled
	D	D00700	Toasted Garlic Bread	SpScr	Fresh store French bread plus pre-made added garlic butter spread
	D	E00800	Rice Pilaf	Scr	Scratch prepared from dry rice plus other added ingredients.
	D	L03801	Spaghetti w Meat Sauce (Ground Beef)	Scr	From dry pasta plus scratch prepared sauce from ingredients
	D	L08801	Baked Italian Sausage Links	Scr	From frozen uncooked product
	D	P00401	French Onion Soup	Scr	All scratch ingredients
	D	Q10500	Broccoli (Frozen)	SpScr	From frozen product- cook/serve
	D	Q10900	Cauliflower (Frozen)	SpScr	From frozen product- cook/serve

**Table A4 (cont'd). NWR Standard Ashore Menu - Variable Menu Items  
by Date and Meal Period**

Date	Meal	Recipe	Menu Item	Type Item	Menu Item Starting Product Form and Preparation Method
8-Jun	Br	D02500	Pancakes (Griddle Cakes)	Scr	Prepared from dry ingredients
(Sun)	Br	E00100	Hot Oatmeal	Adv	Individual serving packets. Patrons add hot water.
Day 14	Br	L11701	Grilled Luncheon Meat	Scr	Canned spam product, sliced and grilled
	Br	L14305	Herbed Baked Chicken (Boneless Breast)	Scr	Frozen raw breast, seasoned and cooked
	Br	O01602	Chicken or Turkey Gravy	Scr	From baked chicken drippings, flour ,etc.
	Br	P01200	Manhattan Clam Chowder	Scr	From ingredients
	Br	Q03300	Parsley Buttered Potatoes	Scr	From fresh potatoes, sliced, seasoned, cooked
	Br	Q04602	Hash Browns (Fz, Shredded)	SpScr	Frozen patties - galley deep fried
	Br	Q10100	Beans Green (Frozen)	SpScr	From frozen product- cook/serve
	D	E00400	Boiled Pasta	Scr	From dry noodles
	D	E80100	Wild Rice (Mix)	SpScr	From boxed dry rice with seasoning packet
	D	L02200	Beef Stew	Scr	From frozen cubed beef, fresh vegetables, plus ingredients
	D	L83600	St Louis Style BBQ Ribs Precooked	Scr	From fresh raw ribs, parboiled, then baked, and galley prepared sauce applied.
	D	P01000	Chicken Gumbo Soup	Scr	From chicken stock plus fresh okra and vegetable rue. No chicken added as out of stock.
	D	Q11000	Corn Whole Kernel (Frozen)	SpScr	From frozen product- cook/serve
	D	Q12100	Spinach (Frozen)	SpScr	From frozen product- cook/serve

## **Appendix B**

### **Work Sampling Data Collection - Methodology, Task Definitions, and Detailed Data**

This appendix details the methodology, procedures, data collection forms, and work task definitions to collect work sampling data to assess the NAS Whidbey Island galley productive workloads to prepare/provide the NWR AFM and the NWR SAM.

In addition, this appendix provides the detailed collected work sampling data for each menu in terms of:

- Average productive work hours by work task and hour of day
- Average productive work hours by work task per day
- Average culinary specialist (CS) and food service attendant (FSA) productive work hours by hour of day
- Actual productive work hours by work task by day.

For the work sampling data collection, Figure B-1 provides the data collection form and B-1 lists the work tasks and work activities included under each. The work tasks and associated work activities were set to separate and capture the galley workload impacts generated by the change in mix of from-scratch, speed-scratch, and advance food products between the SAM and AFM.

For specific details on the differences between the 2 menus during the actual data collection periods, see Appendix A, which provides detailed data by menu item by meal period by day for both menus.

During the AFM and SAM data collection periods, the key difference in galley operations impacting galley workloads was the menu being prepared and associated mix of from-scratch, speed-scratch, and advance food products. Other key factors that potentially impact galley workloads such as time and duration of meal period serving hours; number of main, speed, and specialty serving lines by meal period; and general galley operational and service level concept were held constant with both menus. Another key factor that impacts galley workloads is the number of galley meals prepared and served. Expected galley meals served tend to vary by day of week and also calendar relative to pay day (1st and 15th of month). In general, actual headcounts tend to be higher during week days and lower during weekend days, and higher just prior to pay day and lower just after pay days. To minimize potential differences in galley workloads due to differences in meal period headcount data between the 2 menus, both sets of work sampling data collection covered the same days of the week (Tues thru Sunday) with similar calendar dates relative to pay dates (18-23 March and 3-8 June).

Galley: \_\_\_\_\_

Date: \_\_\_\_\_

Data Collector: \_\_\_\_\_

Task	Hr: _____					Hr: _____					Hr: _____					Hr: _____				
	:00	:15	:30	:45	Tot	:00	:15	:30	:45	Tot	:00	:15	:30	:45	Tot	:00	:15	:30	:45	Tot
Check-In Station (CS)																				
Supply-Receive/Issue (JODs)																				
Galley Supervision (CS)																				
Galley Recordkeeping (CS)																				
Food Storage Area Work (CS)																				
Cook/Prep Food (CS)																				
Kitchen Equip Sanitation (CS)																				
Kitchen Area Sanitation (CS)																				
CS Serving Lines																				
CS Other Productive																				
CS Non Productive																				
FFV Prep (FSA)																				
Salad/Fruit Bars (FSA)																				
FSA Serving Lines																				
Pot/Pan Sanitation (FSA)																				
Dinnerware Sanitation (FSA)																				
Dining/Serving Areas (FSA)																				
FSA Other Productive																				
FSA Non Productive																				
Equipment Repair/Maintenance																				

Figure B1. Work Sampling Data Collection Sheet



**Table B1. Work Sampling Task Definitions**

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**Check-In Station (CS)**

- Prepare to open check-in station, or close at end of serving period.
- Actively monitor/staff patron check-in station (whether actually busy or not).
- Collect cash from cash customers.
- Complete paperwork while at check-in station.

**Supply -Receive/Track/Issue –JOD Only**

- Unload, inventory, and store received supplies.
- Inventory/count store room stocks.
- Supply/store room person breaks/assembles stocks for issue to galley.
- Supply/store room person prepares/completes issue paperwork.
- Processing of rubbish outside for recycling.

**Galley Supervision (CS - Chief, LPO, Galley Supervisor, Watch Captain)**

- NOTE. This tasks covers supervision efforts for the 4 listed Supervisor positions while in the galley prep areas, serving line, and dining areas. The work sampling data collection and this task in particular excludes any supervision activities performed inside the main offices or small galley office. For data collection, supervisors in above positions observed performing a direct work activity like food preparation were recorded under the observed direct work task.
- Meetings/discussions with Galley CS team, FSA leaders, etc.
- Provide instructions, guidance, or directions.
- Actively observes/monitors dining facility operations.

**Galley Recordkeeping (CS)**

- Daily paperwork/record keeping by galley CS team.
- Excludes In Office or Check In Station Recordkeeping.

**Food Storage Area Work (CS)**

- CSs in freezer, or refrigerated or dry store rooms retrieving required stocks, doing food prep activities (e.g. placing portions onto pans for tempering/cooking, transfer to serving line, etc.).
-

**Table B1 (cont'd). Work Sampling Task Definitions**

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**Cook/Prep Foods [CSs]**

- Covers main galley and bakery food prep type activities.
- Obtain ingredients/items for prepping, portioning, heating, cooking, etc.
- Open product cases, inner packages, etc.
- Measure, weight, portion out menu ingredients.
- Prep, assemble, mix, stir, chop/slice, heat or cook menu items.
- Obtain required pots/pans/trays/dishes to prep, reheat, portion, or cook items.
- Transfer menu items/ingredients to pots, pans, or other containers for next step.
- Transfer products to ovens, kettles, fryers, griddles, etc. for cooking/heating.
- Check/monitor equipment status, performance, etc.
- Check/monitor cooking/heating process for food status, condition, doneness, etc.
- Transfer heated/cooked foods to serving line pans.
- Transfer ready to serve foods in serving pans to intermediate holding/storage cabinets (hot or cold) [excludes direct transfer to serving line].
- Cut/portion bulk foods (e.g. whole pies) onto individual portion serving dishes.
- Transfer trays of individual portion dishes to intermediate holding cabinets.
- Transfer soiled pots/pans/kitchen utensils to scullery room for sanitation.
- Collapse boxes, cartons, cases, etc.

**Kitchen Equipment Sanitation [CSs]**

- Clean/sanitize kitchen/bakery cooking equipment (ovens, kettles, steamers, etc.).
- Clean/sanitize other kitchen food prep equipment - slicers, mixers, etc.
- Clean/sanitize bake shop equipment (ovens, mixers, etc.).

**Kitchen Area Sanitation [CSs]**

- Applies to main galley and bakery shop.
  - Transport galley food waste/rubbish containers and packaging waste to outside disposal areas, and process for recycling.
  - EXCLUDES: collapsing of cartons/containers covered under Food Preparation.
  - Sweep/wash kitchen and bakery work area floors/walls (excludes kitchen/food prep equipment, work tables, etc.).
-

**Table B1 (cont'd). Work Sampling Task Definitions**

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**CS Serving Lines**

- ALL hot serving lines (main, speed, mobile, specialty).
  - Set-up/tear down serving lines before and after each meal period.
  - Serve/portion foods and man serving stations awaiting customers.
  - Check/monitor status and replenish serving lines as needed.
  - Replenish serving lines with bulk/individual portion foods.
  - Clean/wipe hot serving line during serving period.
  - Transfer used serving line pans, containers, etc. to pot/pan room for sanitation.
  - Remove/transfer disposable serving pans to rubbish barrel for disposal.
  - After meal period serving line sanitation/cleanup - hot specialty serving line only. (Excludes hot main and short order lines - done by FSAs)
  - Dessert Bar - all work functions to include set-up, monitoring, restocking, cleaning during serving period, tear down, and after meal period final sanitation.

**CS - Other Productive**

- Receive training.
- All other cook productive work activities.
- Note: This task excludes the combined watch change-over meetings.

**CS - Non Productive**

- Not performing any productive value-added work activity.

**FFV Prep - Fresh Fruit Vegetable Prep [FSAs]**

- Wash, slice, dice, cut, peel or other process FFV, etc.
- Clean/sanitize FFV Prep room equipment.
- Clean FFV work area - sweep/mop floors, etc.
- Slice whole fruit and portion onto individual trays.

**Salad/Fruit Bar [FSAs]**

- Set-up/tear down self-serve salad/fruit bar.
  - Obtain clean salad/fruit bar containers for filling.
  - Fill or refill salad/fruit bar containers.
  - Monitor/check salad bar for replenishment needs.
  - Replenish/restock salad/fruit bar items.
  - Transfer salad/fruit bar containers to scullery.
  - Wipe, clean, sanitize salad bar during serving period.
  - Clean/sanitize salad/fruit bar after tear down.
-

**Table B1 (cont'd). Work Sampling Task Definitions**

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**FSA Serving Lines**

- Clean/sanitize MAIN and SPEED hot serving lines after meal periods.
- Self serve beverage/condiment bars - all work functions.
  - Set-up, monitor, restock, cleaning during meal period, and final after meal period sanitation.

**Pot/pan sanitation [FSAs]**

- All work efforts performed to wash/clean/rinse/sanitize pots, pans, beverage containers, serving utensils, etc.
- Transfer sanitized pots/pans and other items to storage for next use.
- Monitor, refill soap/sanitizer dispensers, and operate all scullery room equipment.
- Clean/sanitize scullery room equipment and work area.
- Transfer collected wet food and other waste from pots and pans to outside for disposal.

**Dinnerware sanitation [All FSAs]**

- Monitor/operate/maintain dish room equipment.
- Set up dish room area/equipment to receive customer trays, dishes, etc.
- Break down customer trays.
- Load dishes, glasses, and utensils to be sanitized into racks/containers.
- Load/unload dishwasher with dishes, etc.
- Sort/stack sanitized dishes, utensils, into storage racks, containers, etc.
- Transfer storage racks with clean dishes, glasses, and utensils to serving line.
- Transfer empty storage racks for dishes, glasses, etc to dish room for refilling.
- Clean/sanitize dish room equipment and area.
- Transfer dish room wet food and other waste to outside for disposal.

**Dining/Serving Area [All FSAs]**

- Sweep, clean, mop floors both sides of hot serving lines, and around all other self bars/lines to include - salad bar, dessert bar, beverage bar, condiment bar, etc.
  - Wipe/clean/sanitize dining tables and chairs.
  - Replenish/refill dining table stocks (e.g. napkins, salt/pepper shakers, sugar packets, etc)
  - Sweep, clean, mop floors for all dining room areas, patron area common walkways, entrances, exits, etc.
-

**Table B1 (cont'd). Work Sampling Task Definitions**

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**FSA Other Productive**

- All other FSA productive work activities.

**FSA Non Productive**

- Not performing any productive work activity when observed.

**Equipment Maintenance/Repair [CSs or contractor/others]**

- Repair/maintenance of any galley equipment to include kitchen equipment, food prep equipment, serving line equipment, self serve dispensers, scullery room equipment, dish room equipment, etc.
- 

As detailed in Table B-1, the food preparation task covered a wide range of work activities associated with from-scratch or speed-scratch menu preparation to include: obtain required menu ingredients; measure, weight, and portion out ingredients; obtain required clean pots, pans, and utensils to prep/cook menu items; transfer used pots/pans and utensils from prep area to scullery room for sanitation, etc. Several of these activities while not directly thought of as food preparation, represent work efforts associated with from-scratch preparation which are reduced or perhaps eliminated if the same menu item is procured and provided as a totally prepared frozen advance food product. Therefore, these work activities directly associated with from-scratch preparation are included under the food preparation work task.

Work sampling data collection for each menu covered 6 continuous days from Tuesday through Sunday. On each day, actual workload data collection covered all day watch work activities from their arrival and initial work activities prior to the breakfast (weekdays) or brunch (weekends) meal period, to the completion of all after dinner meal clean-up activities each day. For week days this time period extended from 5:00 AM to about 7:30 PM on average, and for weekend days from 7:00 AM to about 7:30 PM.

In addition, the galley operated a separate night watch of 3 (or 4) Culinary Specialists to prepare and provide a night meal 5 days per week - Sunday night through Thursday night. This watch and associated work activities were not covered by the work sampling data collection. As a result, any workloads or workload impacts associated with the night watch work efforts are excluded and not reflected in the collected work sampling data.

The night watch arrived and started work after the day watch departed after completion of the after dinner meal clean-up activities. The night watch ended at about 5:00 AM with the arrival of the day watch for the breakfast meal. Headcounts for the night meal averaged about 30. In addition to providing the night meal, the night watch also started set-up of the breakfast serving lines, and prepared or pre-prepped several items for the day watch breakfast meal. Examples of these breakfast items include: prep/assembly of wrapped Grab-N-Go breakfast sandwiches, cooking hard boiled eggs, cracking of eggs for omelets to order, etc.

Work sampling observations were recorded at 15 minute intervals to include on the hour, quarter hour, and half hour starting at 5:00 AM and ending with the completion of final after dinner meal clean-up activities. At each time point, the data collector conducted a walk through of all potential main productive work areas inside the galley building. This included the main galley of kitchen food prep and cook areas, FFV prep room, serving lines, pot/pan scullery room, dish room, and customer dining areas. Two limited work areas - inside galley food storage areas (dry, refrigerated, frozen), and the outside dock receiving areas were only checked every 30 minutes on the hour and half hour.

The main galley office, watch captain's office, and supply office were not covered by work sampling data collection. Thus any work efforts performed by the galley supervisors or administrative staff in these areas to include: meetings with galley personnel, preparation of required paperwork and records, etc. are not reflected in the collected workload data. However, differences between the AFM and SAM were not expected to impact any of these type work activities.

As part of the galley walk through data collection process, the data collector would first assess each observed worker as being productive or non-productive based on their activity when first observed. For workers assessed as productive, each was then further categorized as performing the task that best covered the observed work activity. As these assessments were made, the data collector would record the number of workers categorized as performing each task on the data sheet and continue the walk through to the other work areas.

Work sampling data collection covered inside the galley workloads only, plus the outside dock area for the receipt and storage of galley supplies (every 30 minutes). Other outside the galley productive workloads such as external meetings or training requirements, the pick-up of required supplies, and other activities are not reflected in the collected workload data. Also, no extra effort was made during each galley walk through to locate and categorize each on duty but non observed personnel who might have been outside the galley on a break, in the break room, or whatever.

## **B.1 Work Sampling Work Tasks**

A set of productive and non-productive galley work tasks were defined to facilitate work sampling data collection and quantification and comparison of the galley workloads while preparing and providing each menu. To help insure and improve consistency between data collectors, each work task was defined in terms of the specific work activities included or excluded under the task. Table B-1 lists the specific work activities covered under each defined work task. Each work task is discussed below in terms of covered work activities, and differences if any in expected galley workload impacts between the AFM and SAM.

**B.1.1 Check-In Station.** This work task is independent of and not impacted by the menu being prepared by the galley. Work hours for this task are impacted by meal period serving hours and perhaps total meals served. With each menu, the Monday to Friday breakfast, lunch, and dinner meal period hours were the same and the Saturday brunch and dinner meal period hours were the same. Therefore, no differences in observed galley work hours were

expected for this task between the 2 menus. During meal periods, the check in station was staffed or monitored by 1 or 2 CSs. Therefore, differences in workloads between days or between menus is simply due to the proportion of time the station was staffed with 1 or 2 CSs.

**B.1.2 Supply - Receive/Track/Issue - JOD Only.** Workloads associated with this task were expected to be similar for both the AFM and SAM as there was no change in the procedures or frequency of weekly bulk galley deliveries or store room to galley issues.

Instead of every 15 minutes as for the main galley work areas, the galley dock receiving area and main bulk storerooms (dry, frozen, and refrigerated prior to breakout/issue to the galley) were checked every half hour to see if the Jack-of-the-Dusts (JODs) were performing physical productive work activities in these areas to include receiving/storing bulk shipments, arranging/ re-organizing bulk stores, retrieving required items and stocks for issue to galley, etc. The assigned JOD watch only covered Monday thru Friday from about 7:00 AM to 4:00 PM and therefore these work areas were only checked during those time periods. This work task and resulting workload data excludes any productive workloads expended inside the galley supply office.

**B.1.3 Supervision.** This task covered observed supervision type activities by the Galley Chief, LPO, Galley Supervisor, and Watch Captain while out in the galley direct work areas, and excluded any work activities conducted by these individuals within their office areas. Also excluded is the combined watch meeting (about 45 minutes) just prior to galley watch changeovers. For supervisors observed performing a direct galley work activity, the observation was recorded under the appropriate observed work task.

For this work task the observed galley workloads for the AFM and SAM were expected to be similar.

**B.1.4 Galley Recordkeeping.** This work task reflects only observed recordkeeping efforts by the assigned galley CS watch team in the galley work area. Most required galley recordkeeping is completed in the galley office areas by the Galley Chief, LPO, or other assigned CS administrative personnel. This workload was not covered and as a result not reflected in the collected workload data. As a result workloads for this task were expected to be low and also similar for both the AFM and SAM.

**B.1.5 Food Storage Area Work.** Like for the Supply - Receive/Track/Issue task, these work areas were checked only every half hour for productive work efforts due to expected low work loads for the task and need to open and enter the galley's working freezer, refrigerated, and dry storage areas. No meaningful differences in observed workloads for this task were expected between the AFM and SAM.

**B.1.6 Cook/Prep Food.** This is the primary galley work task for which observed CS galley work loads were expected to be impacted and lower with the AFM due to the decreased mix of from-scratch prepared and increased mix of advance and speed-scratch provided menu items as compared to the SAM. The magnitude of the potential galley workload impact relative to this task is dependent on multiple factors to include: the actual mix of advance, speed-scratch, and advance food items in each menu, the difference in mixes between the 2 menus, and actual

menu items included in each menu. For example, required galley work hours for this task can vary significantly between different from-scratch prepared menu items - for example cook/prep work hours for from-scratch prepared lasagna will be higher than that for from-scratch prepared baked boneless chicken breast. Therefore workloads relative to this task are not only dependent on the mix of from-scratch, speed-scratch, and advance food items, but also the actual menu items included within the overall menu itself.

**B.1.7 Kitchen Equipment Sanitation.** This task covered the cleaning and sanitizing of all galleys and bake shop area cooking equipment (ovens, kettles, steamers, fryers, etc) plus all other ancillary equipment to include mixers, slicers, etc. With the AFM, the observed work hours for this task were expected to be potentially somewhat lower due to the reduced usage of galley cooking/ancillary equipment items due to reduced mix of from-scratch prepared items.

**B.1.8 Kitchen Area Sanitation.** This work task covered the normal cleaning of the direct galley and bakery work areas to include floors and walls and collection/removal of any food packaging and food waste generated in these work areas. Galley workloads associated with this work task were expected to be low and the same/similar for both menus.

**B.1.9 CS Serving Lines.** This work task covered all of the listed work tasks assigned to and performed by CSs relative to the hot serving lines (main, speed, and specialty) plus the dessert bar from set-up prior to each meal period, staffing the serving line during the set meal periods, to assigned after meal period CS clean-up tasks. The type and number of serving lines and duration of meal periods were the same with both menus. After meal period cleaning of the hot main and speed line was a FSA work task. Based on the above, the observed workloads for this task were expected to be similar for both menus.

**B.1.10 CS- Other Productive.** This work task covered observed training activities and any other observed CS productive work effort not covered by the other defined CS productive work tasks. The combined galley watch meetings prior to changes in galley watch are excluded and not covered by this task or any other CS productive work task. The observed work hours for this task were expected to be low and similar for each menu.

**B.1.11 CS- Non Productive.** During each walk all observed CSs not actively performing a productive work activity were recorded under this task to include CSs on scheduled meal breaks or work breaks. No extra effort was made to track down or locate on-duty but unobserved CSs. There were no specific expectations between the AFM and SAM relative to observed CS work hours recorded under this category. Any differences are attributable to differences between actual galley staffing levels and required galley staffing levels based on actual galley workloads.

**B.1.12 FFV Prep.** With the AFM, the observed workloads for this task were expected to be perhaps slightly less than that for the SAM for following reasons.

The primary workload for this task is associated with the preparation of items for the breakfast fruit bar and lunch/dinner salad bar. The fruit and salad bars were the same with both menus and with the menus the FFV products were received in the same whole product form



requiring galley pre-processing (e.g. washing, peeling, cutting, chopping, etc.). The AFM did not incorporate lower labor “Fresh Cut” FFV advance product forms (e.g. washed, bagged, chopped, ready-to-use lettuce or salad mix, sliced/diced peppers, etc.). As a result, no large difference in FFV workloads was expected between the 2 menus. However, with the SAM, the FFV workload was expected to be possibly slightly higher due to the pre-processing of FFV for from-scratch prepared soups, and higher mix of galley prepared FFV products for the hot main serving line (e.g. fresh steamed broccoli versus frozen broccoli) or starch items (e.g. potatoes au gratin from fresh potatoes versus frozen heat and serve or dehydrated dry mix).

**B.1.13 Salad/Fruit Bar.** Work loads for this FSA task covered setting up, maintaining, and sanitation/cleanup activities were expected to be similar with both menus. No differences were expected as the salad bars were identical for both menus in terms of set-up, meal period hours, number and types of items daily, and overall self service concept. As a result, any observed differences are attributable to normal day to day variations. Also any workload differences associated with prepping (washing, cutting, slicing, etc) the actual FFV items for the salad bar and captured under the prior separate FFV prep task.

**B.1.14 FSA Serving Lines.** The serving line work activities were broken into separate CS and FSA work tasks and associated work activities. This task covered FSA serving line activities which included all serving line activities for the self serve beverage and condiment bars and for the hot main and speed lines only after meal period sanitation. No meaningful difference in workloads was expected for this task between menus as the type and number of serving lines and overall service concept was the same for both menus.

**B.1.15 Pot/Pan Sanitation.** With the AFM the observed work hours for this task were expected to be lower due to fewer from-scratch prepared menu items and the associated reduction in galley pots, pans, and other items used for from-scratch preparation requiring sanitation. However, during the AFM data collection period, the galley’s main pot/pan sanitation was under major renovation and not available. As a result, the galley pots/pans were washed and rinsed in the bakery area sinks, and then transported on rolling racks to the galleys dish room for running through the dishwasher and final sanitation and subsequent transport back to the galley for re-storage. These extra steps and inefficiencies adversely impacted the expected workload reduction benefits for this task. During the SAM workload data collection, the new renovated pot/pan sanitation room was up and operational.

**B.1.16 Dinnerware Sanitation.** Differences between the Advance and SAM were not expected to impact the galley work hours for this task. This task covered all FSA work activities with setting up, operating, and cleaning the patron dish room area, and washing, sanitizing all customer trays, plates, utensils, and other items and returning these items to the serving lines. Observed dish room work activities associated with final sanitizing of galley pots, pans, and other items during the Advance Menu workload data collection period were recorded under the Pot/Pan Sanitation. Workloads associated with the task are primarily dependent on the duration of meal period serving hours and the total number of patrons served and resulting number of patron trays requiring breakdown, washing/sanitizing, and return to the serving line.

**B.1.17 Dining Serving Area.** Work efforts associated with this FSA work task are primarily dependent on the duration of serving periods and total number of patrons served per meal period. No differences in observed workloads for this task were expected due to differences between the AFM and SAM.

**B.1.18 FSA- Other Productive.** This work task covered all other observed productive FSA work activities not covered by the other defined FSA productive work tasks. The recorded observed work hours for this task were expected to be low and similar for each menu.

**B.1.19 FSA- Non Productive.** During each walk through all observed FSAs not actively performing a productive work activity were recorded under this task to include those on scheduled meal breaks or work breaks. No extra effort was made to track down or locate known on-duty but unobserved FSAs. There were no specific expectations between the AFM and SAM relative to observed FSA work hours recorded under this category. Differences in recorded work hours for this task between menus are solely attributable to differences between the on-duty galley staffing levels and actual galley workloads.

**B.1.20 Equipment Maintenance/Repair.** While the work task covered work activities only for a single worker category - CS or FSA, this task covered work hours expended by both base facilities personnel and also galley CS personnel. Unlike the other work tasks, any work hours for this task are irregular and associated with periodic maintenance or as required repair/maintenance due to breakdown or other issues. Prior to the actual data collection, observed work hours for this task were expected to be low with both menus and perhaps slightly higher with the Standard Menus due to the increased use of cooking and other kitchen equipment associated with from-scratch production. However during the AFM workload data collection period, the galley was also prepping for an inspection for an upcoming Navy Galley Awards competition which the galley was hoping to win. As a result, the observed work hours for this task and also equipment sanitation during the AFM workload data collection are likely elevated and higher than normal.

## **B.2 Average Galley Work Hours by Task and Time of Day**

Galley productive workloads or work hours were estimated based on the collected work sampling data. With the exception of the Supply-Receive/Issue and Food Storage Area Work tasks, work sampling observations and data collection in all inside the galley work areas was every 15 minutes. The work areas associated with the Supply - Receive/Issue task (loading dock area, bulk supply store rooms, and supply office) and Food Storage Area Work task (working galley dry, refrigerated and frozen store rooms) were checked only every 30 minutes. To estimate the productive work hours, the recorded observations for each task were first summed for each clock hour. For the Supply-Receive/Issue and Food Storage Area work tasks this number was multiplied by  $\frac{1}{2}$  hour and for all other tasks this number was multiplied by  $\frac{1}{4}$  hour or the data collection observation interval. This multiplication resulted in the estimated observed productive task work hours by task for each clock hour. For example, if on one day the number of workers observed and recorded as serving at 7 AM, 7:15 AM, 7:30 AM, and 7:45 AM, were 2, 3, 3, and 2, then the summed total serving observations for the 7 AM clock hour was 10. This results in an estimated 2.50 (or 10 times  $\frac{1}{4}$ ) productive serving work hours for the 7 AM clock

hour for the day. For each day, by work task the resulting work hours were summed across all clock hours to estimate total daily work hours for each task. In addition for each day by clock hour, all CS productive task work hours were summed and all FSA productive task work hours were also summed to estimate total CS and total FSA productive work hours by hour of the day.

In summary, for both menus, work sampling day collection covered 6 total days from consecutive galley work days from Tuesday through Sunday. Meal periods and serving hours were the same for both data collection periods to include breakfast (6AM to 8 AM), lunch (11 AM to 1 PM), and dinner (4:30 PM to 6 PM) meal periods Monday to Friday; and brunch (9:30 AM to 1 PM) and dinner (4:30 PM to 6 PM) on Saturday and Sunday. For both menus, the work sampling data collection covered the galley day watch work schedule only which on weekdays started at 5:00 AM and ended about 7:30 PM, and on weekends started at 7:00 AM and also ended at about 7:30 PM. During both data collection periods, no workload data was collected for the galley night watch (3 CSs) which operated 5 nights a week from Sunday night thru Thursday night.

Productive galley workloads may vary from day to day for several reasons to include number of meals prepared/served, the labor content and complexity of specific recipes, and normal workload variations. For the AFM, Tables B-2, B-3, and B-4 detail the galleys estimated average productive work hours by task and clock hour for the weekdays (4), weekend days (2), and all days (6) covered by work sampling data collection. Tables B-5, B-6, and B7 detail the same for the SAM also based on 4 weekdays, 2 weekend days, and 6 total days of work sampling data collection.

To provide insight to the between day workload variations for each menu, Table B-8 details for the AFM the estimated total productive work hours by task for each day covered by work sampling data collection. Table B9 provides similar data and insights based on the work sampling data collected for the SAM

Two key factors that impact galley work hours for several tasks such as food preparation, dish room sanitation, or serving are total meals planned for and total meals served per meal period. For example, if there are differences between these 2 factors, food preparation and pot/pan sanitation work hours are likely more impacted by number of meals planned or prepared (whether served or not), while dish room work hours are more closely impacted by total meals actually served. For the AFM workload data collection period, Table B-10 details the total meals planned (predicted) and the meals served by meal period during the workload data collection period. Table B-11 details the same information for the SAM workload data collection period. Finally, for the periods covered by workload data collection, Table B-12 summarizes and compares the average predicted and actual meal counts by meal period for the 4 week days, 2 weekend days, and across all 6 days of workload data collection.

**Table B2. Advance Food Menu Average Daily Galley Work Hours by Task - 4 Weekdays (Tues-Fri)**

Work Task	Clock Hour																Day
	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	Total
CS-Check-In Station	0.6	1.3	1.5	0.5	0.4	0.8	1.4	1.5	0.9	0.4	0.3	0.9	1.1	0.3	0.0	0.0	11.8
CS-Supply (JODs)	0.0	0.0	0.1	0.2	0.1	0.2	0.4	0.6	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	2.0
CS-Galley Supervision	0.0	0.0	0.1	0.2	0.2	0.1	0.3	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	1.3
CS-Galley Records	0.0	0.1	0.3	0.4	0.4	0.1	0.3	0.1	0.5	0.3	0.0	0.0	0.0	0.3	0.0	0.0	2.6
CS-Food Store Area Wk	0.1	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.6
CS-Cook/Prep Food	1.0	0.9	0.9	2.3	4.4	2.3	1.3	0.7	0.5	1.1	2.3	2.3	0.8	0.4	0.0	0.0	21.2
CS- Kitch Equip Sanit	0.1	0.1	0.0	0.3	0.1	0.2	0.2	0.5	0.2	0.1	0.3	0.3	0.6	0.1	0.0	0.0	2.7
CS-Kitch Area Sanit	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.9
CS-Serving	0.7	3.4	3.5	0.7	0.3	1.1	3.8	3.5	0.9	0.3	0.0	1.1	2.1	0.4	0.0	0.0	21.8
CS-Other Productive	0.1	0.1	0.0	0.1	0.2	0.3	0.1	0.1	0.8	0.1	0.1	0.2	0.2	0.0	0.0	0.0	2.4
CS-Non Productive	1.8	0.5	0.7	3.4	2.4	3.6	0.9	1.6	2.6	2.0	1.3	1.2	0.6	1.3	0.0	0.0	23.8
FSA-FFV Prep	0.1	0.8	1.2	1.3	1.3	0.5	1.1	2.1	1.4	1.3	0.3	0.2	0.2	0.0	0.1	0.0	11.8
FSA-Salad/Fruit Bars	0.0	0.0	0.0	0.0	0.2	0.1	0.8	0.5	0.6	0.0	0.4	0.1	0.3	0.3	0.2	0.0	3.5
FSA-Serving Lines	0.4	0.8	0.8	1.4	0.3	0.3	0.4	0.3	1.5	1.2	1.3	0.4	1.4	1.7	0.5	0.0	12.5
FSA-Pots/Pans	0.0	0.4	0.8	0.3	0.7	0.1	0.4	0.8	1.3	0.8	0.6	0.2	0.8	0.9	0.5	0.0	8.6
FSA-Dinnerware Sanit	0.0	0.6	1.3	1.1	0.6	0.2	1.8	3.1	1.1	1.2	0.6	0.1	2.1	2.3	1.0	0.0	16.8
FSA-Dining/Serv Areas	0.0	0.1	0.2	0.2	0.8	0.3	0.4	0.7	0.8	1.4	1.8	0.5	0.6	0.8	1.3	0.0	9.9
FSA Other Productive	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.4	0.2	0.0	0.3	0.2	0.2	0.0	2.6
FSA-Non Productive	0.0	0.6	0.4	0.6	0.2	0.6	2.3	1.1	1.9	1.1	0.8	1.5	0.8	0.2	0.1	0.0	12.2
Equipment Repair/Maint	0.0	0.1	0.1	0.3	0.8	0.4	0.1	0.1	0.9	1.2	0.2	0.0	0.0	0.4	0.4	0.0	4.9
<b>TOTALS<sup>1</sup></b>	<b>4.8</b>	<b>9.8</b>	<b>11.8</b>	<b>13.4</b>	<b>13.4</b>	<b>11.3</b>	<b>16.4</b>	<b>17.9</b>	<b>16.6</b>	<b>13.1</b>	<b>10.7</b>	<b>9.0</b>	<b>12.0</b>	<b>9.3</b>	<b>4.3</b>	<b>0.0</b>	<b>173.7</b>
<b>CS-Productive<sup>2</sup></b>	<b>2.6</b>	<b>5.9</b>	<b>6.4</b>	<b>5.1</b>	<b>6.9</b>	<b>5.4</b>	<b>8.1</b>	<b>7.6</b>	<b>4.9</b>	<b>3.7</b>	<b>3.4</b>	<b>4.9</b>	<b>5.0</b>	<b>1.8</b>	<b>0.4</b>	<b>0.0</b>	<b>72.1</b>
<b>FSA Productive<sup>3</sup></b>	<b>0.4</b>	<b>2.8</b>	<b>4.3</b>	<b>4.3</b>	<b>3.9</b>	<b>1.7</b>	<b>5.1</b>	<b>7.6</b>	<b>7.1</b>	<b>6.3</b>	<b>5.3</b>	<b>1.4</b>	<b>5.6</b>	<b>6.1</b>	<b>3.8</b>	<b>0.0</b>	<b>65.6</b>

1. Includes all observed CS and FSA task workhours, productive and non-productive.

2. Includes all CS task hours except CS-non productive plus equipment repair/maint hours.

3. Includes all FSA task hours except FSA non-productive.

**Table B3. Advance Food Menu Average Daily Galley Work Hours by Task - 2 Weekend Days (Sat-Sun)**

Work Task	Clock Hour																Day
	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	Total
CS-Check-In Station	0.0	0.0	0.4	0.4	0.8	0.9	1.0	0.9	0.6	0.1	0.0	0.8	1.3	0.3	0.0	0.0	<b>7.3</b>
CS-Supply (JODs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<b>0.0</b>
CS-Galley Supervision	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.0	0.0	<b>0.6</b>
CS-Galley Records	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0	<b>0.5</b>
CS-Food Store Area Wk	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	<b>0.4</b>
CS-Cook/Prep Food	0.0	0.0	0.9	2.9	0.8	1.1	1.1	1.0	0.9	1.6	2.8	0.9	0.3	0.1	0.0	0.0	<b>14.3</b>
CS- Kitch Equip Sanit	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	<b>0.8</b>
CS-Kitch Area Sanit	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.0	0.0	<b>0.8</b>
CS-Serving	0.0	0.0	0.0	0.0	1.5	2.3	2.9	3.1	0.5	0.0	0.1	1.3	1.9	0.4	0.0	0.0	<b>13.9</b>
CS-Other Productive	0.0	0.0	0.1	0.9	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<b>1.5</b>
CS-Non Productive	0.0	0.0	0.8	1.1	2.3	1.5	1.3	0.5	2.0	1.1	1.1	1.9	0.5	0.5	0.0	0.0	<b>14.5</b>
FSA-FFV Prep	0.0	0.0	0.0	0.8	1.3	1.0	0.9	0.6	0.3	1.3	1.0	0.4	0.0	0.0	0.0	0.0	<b>7.4</b>
FSA-Salad/Fruit Bars	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.1	0.6	0.0	0.0	0.1	0.6	0.3	0.1	0.0	<b>2.3</b>
FSA-Serving Lines	0.0	0.0	0.0	0.1	0.3	0.1	0.8	0.1	1.8	1.3	0.1	0.4	0.3	1.3	0.4	0.0	<b>6.8</b>
FSA-Pots/Pans	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.5	0.8	0.5	0.1	0.0	1.0	0.8	0.3	0.0	<b>5.3</b>
FSA-Dinnerware Sanit	0.0	0.0	0.0	0.0	0.0	0.6	1.5	2.0	1.0	0.4	0.3	0.0	2.6	1.6	0.5	0.0	<b>10.5</b>
FSA-Dining/Serv Areas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4	0.9	0.0	0.0	0.8	0.9	0.0	<b>4.1</b>
FSA Other Productive	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	<b>0.3</b>
FSA-Non Productive	0.0	0.0	0.0	0.5	0.3	1.1	1.8	1.8	1.3	1.5	1.9	2.6	0.6	0.6	0.3	0.0	<b>14.1</b>
Equipment Repair/Maint	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<b>0.0</b>
<b>TOTALS<sup>1</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>2.1</b>	<b>6.8</b>	<b>8.0</b>	<b>9.1</b>	<b>12.4</b>	<b>10.8</b>	<b>9.9</b>	<b>9.6</b>	<b>8.6</b>	<b>8.4</b>	<b>10.3</b>	<b>6.8</b>	<b>2.4</b>	<b>0.0</b>	<b>105.0</b>
<b>CS-Productive<sup>2</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>1.4</b>	<b>4.3</b>	<b>3.8</b>	<b>4.3</b>	<b>5.1</b>	<b>5.1</b>	<b>2.0</b>	<b>2.3</b>	<b>3.3</b>	<b>3.0</b>	<b>4.5</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>39.9</b>
<b>FSA Productive<sup>3</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.9</b>	<b>1.8</b>	<b>2.3</b>	<b>4.3</b>	<b>3.4</b>	<b>4.6</b>	<b>4.8</b>	<b>2.4</b>	<b>0.9</b>	<b>4.6</b>	<b>4.6</b>	<b>2.1</b>	<b>0.0</b>	<b>36.5</b>

1. Includes all observed CS and FSA task workhours, productive and non-productive.

2. Includes all CS task hours except CS-non productive plus equipment repair/maint hours.

3. Includes all FSA task hours except FSA non-productive.

**Table B4. Advance Food Menu Average Daily Galley Work Hours by Task - 6 Total Days (Tue-Sun)**

Work Task	Clock Hour																Day
	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	Total
CS-Check-In Station	0.4	0.9	1.1	0.5	0.6	0.8	1.3	1.3	0.8	0.3	0.2	0.9	1.2	0.3	0.0	0.0	<b>10.4</b>
CS-Supply (JODs)	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	<b>1.3</b>
CS-Galley Supervision	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0.2	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	<b>1.1</b>
CS-Galley Records	0.0	0.0	0.2	0.3	0.3	0.0	0.2	0.1	0.3	0.3	0.0	0.0	0.0	0.2	0.0	0.0	<b>1.9</b>
CS-Food Store Area Wk	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	<b>0.5</b>
CS-Cook/Prep Food	0.7	0.7	1.3	2.3	3.4	1.9	1.2	0.8	0.6	1.3	2.5	1.8	0.6	0.3	0.0	0.0	<b>19.2</b>
CS- Kitch Equip Sanit	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.4	0.1	0.0	0.2	0.2	0.5	0.0	0.0	0.0	<b>2.0</b>
CS-Kitch Area Sanit	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	<b>0.9</b>
CS-Serving	0.5	2.3	2.3	0.8	0.7	1.6	3.5	3.4	0.8	0.2	0.0	1.2	2.0	0.4	0.0	0.0	<b>19.5</b>
CS-Other Productive	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.0	0.5	0.1	0.1	0.1	0.1	0.0	0.0	0.0	<b>2.1</b>
CS-Non Productive	1.2	0.6	0.6	2.8	2.3	3.0	1.0	1.2	2.4	1.7	1.2	1.4	0.6	1.0	0.0	0.0	<b>21.0</b>
FSA-FFV Prep	0.0	0.5	0.9	1.3	1.2	0.6	1.0	1.6	1.0	1.3	0.5	0.3	0.1	0.0	0.1	0.0	<b>10.4</b>
FSA-Salad/Fruit Bars	0.0	0.0	0.0	0.0	0.2	0.1	0.6	0.4	0.6	0.0	0.3	0.1	0.4	0.3	0.2	0.0	<b>3.1</b>
FSA-Serving Lines	0.3	0.5	0.6	1.0	0.3	0.4	0.5	0.2	1.6	1.2	0.9	0.4	1.0	1.5	0.5	0.0	<b>10.8</b>
FSA-Pots/Pans	0.0	0.3	0.5	0.2	0.5	0.3	0.5	0.7	1.1	0.7	0.5	0.1	0.9	0.8	0.4	0.0	<b>7.6</b>
FSA-Dinnerware Sanit	0.0	0.4	0.8	0.7	0.5	0.5	1.7	2.7	1.0	0.9	0.5	0.0	2.3	2.0	0.8	0.0	<b>15.0</b>
FSA-Dining/Serv Areas	0.0	0.1	0.1	0.1	0.5	0.2	0.3	0.5	0.6	1.4	1.5	0.3	0.4	0.8	1.1	0.0	<b>8.0</b>
FSA Other Productive	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.0	0.2	0.1	0.1	0.0	<b>1.9</b>
FSA-Non Productive	0.0	0.4	0.3	0.5	0.3	0.9	2.1	1.3	1.7	1.3	1.2	1.9	0.8	0.3	0.2	0.0	<b>13.1</b>
Equipment Repair/Maint	0.0	0.0	0.0	0.2	0.5	0.3	0.1	0.1	0.6	0.8	0.1	0.0	0.0	0.3	0.3	0.0	<b>3.3</b>
<b>TOTALS<sup>1</sup></b>	<b>3.2</b>	<b>6.8</b>	<b>9.1</b>	<b>11.5</b>	<b>11.9</b>	<b>11.3</b>	<b>15.1</b>	<b>15.5</b>	<b>14.3</b>	<b>12.0</b>	<b>10.0</b>	<b>8.8</b>	<b>11.4</b>	<b>8.5</b>	<b>3.6</b>	<b>0.0</b>	<b>153.0</b>
<b>CS-Productive<sup>2</sup></b>	<b>1.8</b>	<b>4.0</b>	<b>5.2</b>	<b>4.8</b>	<b>6.0</b>	<b>5.2</b>	<b>7.1</b>	<b>6.8</b>	<b>3.9</b>	<b>3.2</b>	<b>3.3</b>	<b>4.3</b>	<b>4.8</b>	<b>1.5</b>	<b>0.3</b>	<b>0.0</b>	<b>62.2</b>
<b>FSA Productive<sup>3</sup></b>	<b>0.3</b>	<b>1.9</b>	<b>3.0</b>	<b>3.3</b>	<b>3.3</b>	<b>2.3</b>	<b>4.8</b>	<b>6.2</b>	<b>6.3</b>	<b>5.8</b>	<b>4.3</b>	<b>1.3</b>	<b>5.3</b>	<b>5.6</b>	<b>3.2</b>	<b>0.0</b>	<b>56.7</b>

1. Includes all observed CS and FSA task workhours, productive and non-productive.

2. Includes all CS task hours except CS-non productive plus equipment repair/maint hours.

3. Includes all FSA task hours except FSA non-productive.

**Table B5. Standard Ashore Menu Average Daily Galley Work Hours by Task - 4 Weekdays (Tues-Fri)**

Work Task	Clock Hour																Day
	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	Total
CS-Check-In Station	0.4	1.0	1.3	0.8	0.1	0.3	1.3	1.4	1.5	0.8	0.0	0.7	1.3	0.5	0.0		11.3
CS-Supply (JODs)	0.0	0.0	0.6	0.3	0.0	0.4	0.4	0.6	1.0	0.5	0.0	0.0	0.0	0.0	0.0		3.8
CS-Galley Supervision	0.1	0.1	0.1	0.5	0.3	0.0	0.0	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0		1.5
CS-Galley Records	0.0	0.0	0.1	0.3	0.4	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		1.1
CS-Food Store Area Wk	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0		0.5
CS-Cook/Prep Food	0.8	1.0	0.9	1.2	3.8	3.6	1.3	1.6	0.9	1.6	2.9	1.4	0.4	0.2	0.0		21.6
CS- Kitch Equip Sanit	0.0	0.0	0.1	0.1	0.4	0.1	0.9	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.0		2.7
CS-Kitch Area Sanit	0.0	0.1	0.3	0.3	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.4	0.5	0.1	0.0		2.3
CS-Serving	0.6	2.7	2.4	0.8	0.5	1.1	3.2	2.9	0.5	0.3	0.0	0.9	2.2	0.5	0.0		18.5
CS-Other Productive	0.1	0.1	0.1	0.1	0.0	0.1	0.4	0.3	0.5	0.6	0.3	0.3	0.3	0.0	0.0		3.1
CS-Non Productive	1.3	0.4	0.9	1.2	2.6	2.0	0.8	1.1	2.9	1.4	1.6	1.3	0.4	1.1	0.0		18.8
FSA-FFV Prep	0.1	0.7	1.3	1.1	1.1	0.6	1.4	2.1	1.9	1.3	0.5	0.3	0.2	0.2	0.0		12.6
FSA-Salad/Fruit Bars	0.1	0.1	0.1	0.0	0.2	0.1	0.5	0.7	0.6	0.3	0.3	0.3	0.3	0.4	0.1		3.8
FSA-Serving Lines	0.1	0.6	0.4	1.2	0.3	0.3	0.1	0.4	1.2	1.0	1.4	0.2	1.0	1.3	0.3		9.7
FSA-Pots/Pans	0.0	0.4	0.7	0.2	0.7	0.3	0.6	1.3	1.3	0.8	0.6	0.2	0.8	0.8	0.3		8.8
FSA-Dinnerware Sanit	0.0	0.5	1.3	1.0	0.8	0.4	2.3	4.1	2.1	1.0	0.3	0.1	2.9	1.9	0.9		19.4
FSA-Dining/Serv Areas	0.0	0.1	0.1	0.1	0.8	0.2	0.0	0.3	0.4	1.5	1.6	0.1	0.1	1.6	0.8		7.5
FSA Other Productive	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.7	0.6	0.3	0.2	0.1	0.2	0.0		2.9
FSA-Non Productive	0.1	0.6	0.3	0.3	0.7	1.3	1.8	0.6	1.4	1.0	1.8	1.9	0.9	0.5	0.5		13.7
Equipment Repair/Maint	0.0	0.3	0.1	0.5	0.3	0.2	0.1	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0		2.1
<b>TOTALS<sup>1</sup></b>	<b>3.9</b>	<b>8.6</b>	<b>11.3</b>	<b>9.9</b>	<b>12.9</b>	<b>10.9</b>	<b>15.5</b>	<b>18.2</b>	<b>17.5</b>	<b>13.1</b>	<b>11.9</b>	<b>8.2</b>	<b>11.5</b>	<b>9.4</b>	<b>2.9</b>	<b>0.0</b>	<b>165.7</b>
<b>CS-Productive<sup>2</sup></b>	<b>2.2</b>	<b>5.2</b>	<b>6.1</b>	<b>4.8</b>	<b>5.8</b>	<b>5.8</b>	<b>7.9</b>	<b>7.4</b>	<b>5.1</b>	<b>4.4</b>	<b>3.8</b>	<b>3.8</b>	<b>4.8</b>	<b>1.6</b>	<b>0.0</b>	<b>0.0</b>	<b>68.4</b>
<b>FSA Productive<sup>3</sup></b>	<b>0.4</b>	<b>2.4</b>	<b>3.9</b>	<b>3.6</b>	<b>3.9</b>	<b>1.9</b>	<b>4.9</b>	<b>9.1</b>	<b>8.1</b>	<b>6.4</b>	<b>4.9</b>	<b>1.3</b>	<b>5.4</b>	<b>6.3</b>	<b>2.4</b>	<b>0.0</b>	<b>64.8</b>

1. Includes all observed CS and FSA task workhours, productive and non-productive.

2. Includes all CS task hours except CS-non productive plus equipment repair/maint hours.

3. Includes all FSA task hours except FSA non-productive.

**Table B6. Standard Ashore Menu Average Daily Galley Work Hours by Task - 2 Weekend Days (Sat-Sun)**

Work Task	Clock Hour																Day
	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	Total
CS-Check-In Station	0.0	0.0	0.1	0.1	0.6	1.0	1.0	1.0	0.3	0.0	0.0	0.8	1.0	0.3	0.0		6.1
CS-Supply (JODs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
CS-Galley Supervision	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0		0.5
CS-Galley Records	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0		0.1
CS-Food Store Area Wk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
CS-Cook/Prep Food	0.0	0.0	0.6	3.3	0.6	1.4	2.1	1.9	0.9	1.8	5.0	1.8	1.1	0.4	0.4		21.1
CS- Kitch Equip Sanit	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	1.0	1.3	0.1	0.8	0.1	0.1	0.0		3.8
CS-Kitch Area Sanit	0.0	0.0	0.0	0.3	0.3	0.1	0.4	0.3	0.4	0.4	0.0	0.5	0.3	0.0	0.0		2.8
CS-Serving	0.0	0.0	0.0	0.5	1.3	2.9	3.6	2.4	0.6	0.0	0.0	1.4	1.9	0.9	0.0		15.4
CS-Other Productive	0.0	0.0	0.1	0.6	0.8	0.1	0.1	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0		2.6
CS-Non Productive	0.0	0.0	0.1	0.4	2.1	0.4	0.1	0.4	0.8	0.4	0.6	0.9	0.5	0.5	0.0		7.1
FSA-FFV Prep	0.0	0.0	0.0	0.4	0.8	0.9	1.0	0.3	1.0	1.4	1.4	0.6	0.3	0.0	0.1		8.0
FSA-Salad/Fruit Bars	0.0	0.0	0.0	0.0	0.8	0.0	0.4	0.6	0.8	0.0	0.1	0.4	0.5	0.6	0.0		4.1
FSA-Serving Lines	0.0	0.0	0.0	0.3	0.0	0.0	0.4	1.1	1.0	1.5	0.3	0.3	1.1	0.9	0.8		7.5
FSA-Pots/Pans	0.0	0.0	0.0	0.0	0.0	0.5	0.8	0.4	1.1	0.8	0.0	0.5	1.1	1.0	0.4		6.5
FSA-Dinnerware Sanit	0.0	0.0	0.0	0.0	0.0	0.8	2.1	3.1	1.9	0.6	0.0	0.5	2.8	2.3	0.5		14.5
FSA-Dining/Serv Areas	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	1.3	0.6	0.0	0.0	1.0	0.5		4.1
FSA Other Productive	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.1		1.4
FSA-Non Productive	0.0	0.0	0.0	0.3	0.1	0.6	0.8	1.1	1.8	0.5	3.0	2.9	0.8	0.6	1.3		13.6
Equipment Repair/Maint	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
<b>TOTALS<sup>1</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>1.0</b>	<b>6.3</b>	<b>7.4</b>	<b>8.9</b>	<b>13.6</b>	<b>13.5</b>	<b>12.0</b>	<b>10.1</b>	<b>11.4</b>	<b>11.1</b>	<b>11.4</b>	<b>8.6</b>	<b>4.0</b>	<b>0.0</b>	<b>119.3</b>
<b>CS-Productive<sup>2</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>0.9</b>	<b>5.0</b>	<b>3.5</b>	<b>5.5</b>	<b>7.3</b>	<b>6.4</b>	<b>3.3</b>	<b>3.6</b>	<b>5.4</b>	<b>5.1</b>	<b>4.4</b>	<b>1.8</b>	<b>0.4</b>	<b>0.0</b>	<b>52.4</b>
<b>FSA Productive<sup>3</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.6</b>	<b>1.6</b>	<b>2.4</b>	<b>5.5</b>	<b>5.6</b>	<b>6.3</b>	<b>5.6</b>	<b>2.4</b>	<b>2.3</b>	<b>5.8</b>	<b>5.8</b>	<b>2.4</b>	<b>0.0</b>	<b>46.1</b>

1. Includes all observed CS and FSA task workhours, productive and non-productive.

2. Includes all CS task hours except CS-non productive plus equipment repair/maint hours.

3. Includes all FSA task hours except FSA non-productive.



**Table B7. Standard Ashore Menu Average Daily Galley Work Hours by Task - 6 Total Days (Tue-Sun)**

Work Task	Clock Hour																Day
	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	Total
CS-Check-In Station	0.3	0.7	0.9	0.5	0.3	0.5	1.2	1.3	1.1	0.5	0.0	0.7	1.2	0.4	0.0	0.0	<b>9.6</b>
CS-Supply (JODs)	0.0	0.0	0.4	0.2	0.0	0.3	0.3	0.4	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	<b>2.5</b>
CS-Galley Supervision	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	<b>1.2</b>
CS-Galley Records	0.0	0.0	0.1	0.2	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<b>0.8</b>
CS-Food Store Area Wk	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<b>0.3</b>
CS-Cook/Prep Food	0.5	0.7	0.8	1.9	2.8	2.8	1.5	1.7	0.9	1.7	3.6	1.5	0.7	0.3	0.1	0.0	<b>21.4</b>
CS- Kitch Equip Sanit	0.0	0.0	0.1	0.1	0.3	0.0	0.6	0.1	0.4	0.5	0.1	0.4	0.2	0.3	0.0	0.0	<b>3.0</b>
CS-Kitch Area Sanit	0.0	0.0	0.2	0.3	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.4	0.4	0.0	0.0	0.0	<b>2.5</b>
CS-Serving	0.4	1.8	1.6	0.7	0.8	1.7	3.3	2.8	0.5	0.2	0.0	1.0	2.1	0.6	0.0	0.0	<b>17.5</b>
CS-Other Productive	0.1	0.0	0.1	0.3	0.3	0.1	0.3	0.4	0.4	0.4	0.2	0.2	0.2	0.0	0.0	0.0	<b>2.9</b>
CS-Non Productive	0.8	0.3	0.7	0.9	2.4	1.5	0.6	0.9	2.2	1.0	1.3	1.1	0.4	0.9	0.0	0.0	<b>14.9</b>
FSA-FFV Prep	0.1	0.5	0.8	0.9	1.0	0.7	1.3	1.5	1.6	1.3	0.8	0.4	0.2	0.1	0.0	0.0	<b>11.1</b>
FSA-Salad/Fruit Bars	0.0	0.0	0.0	0.0	0.4	0.1	0.5	0.7	0.6	0.2	0.2	0.3	0.4	0.5	0.1	0.0	<b>3.9</b>
FSA-Serving Lines	0.1	0.4	0.3	0.9	0.2	0.2	0.2	0.6	1.1	1.2	1.0	0.2	1.0	1.1	0.5	0.0	<b>9.0</b>
FSA-Pots/Pans	0.0	0.3	0.5	0.1	0.5	0.4	0.6	1.0	1.3	0.8	0.4	0.3	0.9	0.8	0.3	0.0	<b>8.0</b>
FSA-Dinnerware Sanit	0.0	0.3	0.9	0.7	0.5	0.5	2.2	3.8	2.0	0.9	0.2	0.2	2.9	2.0	0.8	0.0	<b>17.8</b>
FSA-Dining/Serv Areas	0.0	0.0	0.1	0.1	0.5	0.2	0.1	0.2	0.3	1.4	1.3	0.1	0.0	1.4	0.7	0.0	<b>6.4</b>
FSA Other Productive	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.5	0.5	0.2	0.1	0.1	0.1	0.0	0.0	<b>2.4</b>
FSA-Non Productive	0.0	0.4	0.2	0.3	0.5	1.0	1.5	0.8	1.5	0.8	2.2	2.2	0.9	0.5	0.8	0.0	<b>13.7</b>
Equipment Repair/Maint	0.0	0.2	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	<b>1.4</b>
<b>TOTALS<sup>1</sup></b>	<b>2.6</b>	<b>5.7</b>	<b>7.9</b>	<b>8.7</b>	<b>11.0</b>	<b>10.2</b>	<b>14.9</b>	<b>16.6</b>	<b>15.7</b>	<b>12.1</b>	<b>11.8</b>	<b>9.2</b>	<b>11.5</b>	<b>9.2</b>	<b>3.3</b>	<b>0.0</b>	<b>150.2</b>
<b>CS-Productive<sup>2</sup></b>	<b>1.5</b>	<b>3.5</b>	<b>4.4</b>	<b>4.8</b>	<b>5.0</b>	<b>5.7</b>	<b>7.7</b>	<b>7.0</b>	<b>4.5</b>	<b>4.1</b>	<b>4.3</b>	<b>4.3</b>	<b>4.7</b>	<b>1.6</b>	<b>0.1</b>	<b>0.0</b>	<b>63.1</b>
<b>FSA Productive<sup>3</sup></b>	<b>0.3</b>	<b>1.6</b>	<b>2.6</b>	<b>2.6</b>	<b>3.1</b>	<b>2.0</b>	<b>5.1</b>	<b>7.9</b>	<b>7.5</b>	<b>6.1</b>	<b>4.0</b>	<b>1.6</b>	<b>5.5</b>	<b>6.1</b>	<b>2.4</b>	<b>0.0</b>	<b>58.5</b>

1. Includes all observed CS and FSA task workhours, productive and non-productive.

2. Includes all CS task hours except CS-non productive plus equipment repair/maint hours.

3. Includes all FSA task hours except FSA non-productive.

**Table B-8. Advance Food Menu - Observed Work Hours  
By Day and Task (3/18/08-3/23/08)**

Work Task	Weekday					Weekend			Overall Ave
	Tue	Wed	Thu	Fri	Ave	Sat	Sun	Ave	
CS-Check-In Station	11.3	10.3	14.3	11.3	11.8	7.8	6.8	7.3	10.3
CS-Supply (JODs)	1.8	1.8	2.0	2.5	2.0	0.0	0.0	0.0	1.3
CS-Galley Supervision	1.5	2.5	1.3	0.0	1.3	1.0	0.3	0.6	1.1
CS-Galley Records	4.3	2.0	1.5	2.5	2.6	0.8	0.3	0.5	1.9
CS-Food Store Area Wk	0.8	0.5	0.8	0.3	0.6	0.0	0.8	0.4	0.5
CS-Cook/Prep Food	22.5	21.0	20.8	20.5	21.2	12.8	15.8	14.3	18.9
CS- Kitch Equip Sanit	2.3	3.0	3.3	2.3	2.7	0.8	0.8	0.8	2.0
CS-Kitch Area Sanit	0.3	2.0	1.0	0.5	0.9	0.8	0.8	0.8	0.9
CS-Serving	24.8	25.8	18.3	18.5	21.8	15.3	12.5	13.9	19.2
CS-Other Productive	1.5	3.0	2.3	2.8	2.4	2.0	1.0	1.5	2.1
Equipment Repair/Maint	8.5	5.3	2.3	3.5	4.9	0.0	0.0	0.0	3.3
FSA-FFV Prep	12.0	12.0	12.3	10.8	11.8	7.8	7.0	7.4	10.3
FSA-Salad/Fruit Bars	3.0	3.8	4.0	3.3	3.5	2.3	2.3	2.3	3.1
FSA-Serving Lines	9.8	15.8	14.3	10.3	12.5	5.8	7.8	6.8	10.6
FSA-Pots/Pans	9.3	7.3	8.3	9.5	8.6	5.8	4.8	5.3	7.5
FSA-Dinnerware Sanit	14.0	19.5	18.5	15.3	16.8	10.5	10.5	10.5	14.7
FSA-Dining/Serv Areas	12.8	10.8	8.8	7.3	9.9	4.5	3.8	4.1	8.0
FSA Other Productive	4.5	4.0	1.8	0.3	2.6	0.0	0.5	0.3	1.8
<b>CS Productive Hours<sup>1</sup></b>	<b>79.3</b>	<b>77.0</b>	<b>67.5</b>	<b>64.5</b>	<b>72.1</b>	<b>41.0</b>	<b>38.8</b>	<b>39.9</b>	<b>61.3</b>
<b>FSA Productive Hours<sup>2</sup></b>	<b>65.3</b>	<b>73.0</b>	<b>67.8</b>	<b>56.5</b>	<b>65.6</b>	<b>36.5</b>	<b>36.5</b>	<b>36.5</b>	<b>55.9</b>
<b>Total Productive Hours</b>	<b>144.5</b>	<b>150.0</b>	<b>135.3</b>	<b>121.0</b>	<b>137.7</b>	<b>77.5</b>	<b>75.3</b>	<b>76.4</b>	<b>117.3</b>
CS-Non Productive	25.0	26.5	18.5	25.3	23.8	16.3	12.8	14.5	20.7
FSA-Non Productive	14.3	10.8	10.5	13.3	12.2	15.3	13.0	14.1	12.8
<b>Total Non Productive</b>	<b>39.3</b>	<b>37.3</b>	<b>29.0</b>	<b>38.5</b>	<b>36.0</b>	<b>31.5</b>	<b>25.8</b>	<b>28.6</b>	<b>33.5</b>

1. Includes work hours for all above listed CS tasks plus equipment repair/maintenance.

2. Includes work hours for all above FSA listed tasks.

**Table B-9. Standard Ashore Menu - Observed Work Hours  
By Day and Task (6/3/08-6/8/08)**

Work Task	Weekday					Weekend			Overall Ave
	Tue	Wed	Thu	Fri	Ave	Sat	Sun	Ave	
CS-Check-In Station	10.5	12.0	11.3	11.5	11.3	6.0	6.3	6.1	9.6
CS-Supply (JODs)	4.0	3.8	4.0	3.5	3.8	0.0	0.0	0.0	2.5
CS-Galley Supervision	1.0	3.0	1.8	0.3	1.5	0.5	0.5	0.5	1.2
CS-Galley Records	0.8	2.3	1.5	0.0	1.1	0.3	0.0	0.1	0.8
CS-Food Store Area Wk	0.5	1.0	0.5	0.0	0.5	0.0	0.0	0.0	0.3
CS-Cook/Prep Food	23.0	18.3	22.5	22.5	21.6	20.3	22.0	21.1	21.4
CS- Kitch Equip Sanit	4.0	1.0	2.0	3.8	2.7	2.8	4.8	3.8	3.0
CS-Kitch Area Sanit	2.0	1.8	2.5	3.0	2.3	2.8	2.8	2.8	2.5
CS-Serving	16.3	18.0	21.3	18.5	18.5	15.5	15.3	15.4	17.5
CS-Other Productive	3.0	3.0	2.5	3.8	3.1	4.0	1.3	2.6	2.9
Equipment Repair/Maint	1.3	2.3	3.0	1.8	2.1	0.0	0.0	0.0	1.4
FSA-FFV Prep	11.3	13.3	12.5	13.5	12.6	7.3	8.8	8.0	11.1
FSA-Salad/Fruit Bars	3.3	3.3	4.5	4.3	3.8	4.0	4.3	4.1	3.9
FSA-Serving Lines	11.5	9.8	7.5	10.0	9.7	7.3	7.8	7.5	9.0
FSA-Pots/Pans	9.3	8.3	7.8	9.8	8.8	5.5	7.5	6.5	8.0
FSA-Dinnerware Sanit	16.0	21.0	20.5	20.3	19.4	12.8	16.3	14.5	17.8
FSA-Dining/Serv Areas	7.3	8.0	7.8	7.0	7.5	3.0	5.3	4.1	6.4
FSA Other Productive	3.5	2.3	3.5	2.5	2.9	1.8	1.0	1.4	2.4
<b>CS Productive Hours1</b>	<b>66.3</b>	<b>66.3</b>	<b>72.8</b>	<b>68.5</b>	<b>68.4</b>	<b>52.0</b>	<b>52.8</b>	<b>52.4</b>	<b>63.1</b>
<b>FSA Productive Hours2</b>	<b>62.0</b>	<b>65.8</b>	<b>64.0</b>	<b>67.3</b>	<b>64.8</b>	<b>41.5</b>	<b>50.8</b>	<b>46.1</b>	<b>58.5</b>
<b>Total Productive Hours</b>	<b>128.3</b>	<b>132.0</b>	<b>136.8</b>	<b>135.8</b>	<b>133.2</b>	<b>93.5</b>	<b>103.5</b>	<b>98.5</b>	<b>121.6</b>
CS-Non Productive	14.0	20.3	24.5	16.5	18.8	9.5	4.8	7.1	14.9
FSA-Non Productive	17.5	11.5	12.3	13.5	13.7	14.8	12.5	13.6	13.7
<b>TotalL Non Productive</b>	<b>31.5</b>	<b>31.8</b>	<b>36.8</b>	<b>30.0</b>	<b>32.5</b>	<b>24.3</b>	<b>17.3</b>	<b>20.8</b>	<b>28.6</b>

1. Includes work hours for all above listed CS tasks plus equipment repair/maintenance.

2. Includes work hours for all above FSA listed tasks.

**Table B10. Advance Food Menu Worksampling Period - Meals Served and Ration Credits**

Worksampling Data Collection Date Day		Predicted <sup>1</sup>					Actual Meals & Earned Rations <sup>1</sup>					
		Meals				Ration Credits	Meals				Ration Credits	% Pred Credits
		Brkt	Lunch	Dinner	Total		Brkt	Lunch	Dinner	Total		
18-Mar	Tue	169	447	238	854	308	146	412	206	764	276	90%
19-Mar	Wed	180	433	249	862	309	146	370	190	706	253	82%
20-Mar	Thu	212	420	225	857	300	176	329	191	696	243	81%
21-Mar	Fri	154	344	150	648	228	118	314	147	579	208	91%
22-Mar	Sat	0	244	108	352	169	0	279	130	409	197	116%
23-Mar	Sun	0	239	143	382	186	0	207	171	378	187	101%
Ave - Weekdays (4)		179	411	216	805	286	147	356	184	686	245	86%
Ave - Weekend Days (2)		0	242	126	367	178	0	243	151	394	192	108%
Ave - All Days (6)		119	355	186	659	250	98	319	173	589	228	91%

1. Meal counts and ration credits exclude predicted and actual night meals served Sun to Thursday only.

**Table B11. Standard Ashore Menu Worksampling Period - Meals Served and Ration Credits**

Worksampling Data Collection Date Day		Predicted <sup>1</sup>					Actual Meals & Earned Rations <sup>1</sup>					
		Meals				Ration Credits	Meals				Ration Credits	% Pred Credits
		Brkt	Lunch	Dinner	Total		Brkt	Lunch	Dinner	Total		
3-Jun	Tue	189	398	234	821	291	184	375	215	774	273	94%
4-Jun	Wed	204	397	240	841	296	175	403	217	795	283	96%
5-Jun	Thu	187	379	219	785	277	184	383	197	764	269	97%
6-Jun	Fri	176	290	148	614	210	152	339	175	666	236	112%
7-Jun	Sat	0	242	118	360	174	0	317	152	469	226	130%
8-Jun	Sun	0	252	139	391	190	0	354	207	561	273	144%
Ave - Weekdays (4)		189	366	210	765	268	174	375	201	750	265	99%
Ave - Weekend Days (2)		0	247	129	376	182	0	336	180	515	250	137%
Ave - All Days (6)		126	326	183	635	239	116	362	194	672	260	109%

1. Meal counts and ration credits exclude predicted and actual night meals served Sun to Thursday only.

**Table B12: Predicted and Actual Daily Average Total Meals and  
Ration Credits During Worksampling Data Collection**

Data Collection Cycle		Predicted <sup>1</sup>		Actuals <sup>1</sup>		Actual to
Menu	Days of Week	Total Meals	Rations Credits	Total Meals	Rations Credits	Predicted Percent
Advance Food Menu (18-23 March)	Tue-Fri (4)	805	286	686	245	86%
	Sat -Sun (2)	367	178	394	192	108%
	All (6)	659	250	589	228	91%
Standard Ashore Menu (3-8 June)	Tue-Fri (4)	765	268	750	265	99%
	Sat -Sun (2)	376	182	515	250	137%
	All (6)	635	239	672	260	109%
Advance to Standard Menu Ratio	Tue-Fri (4)	105%	107%	92%	92%	----
	Sat -Sun (2)	98%	98%	76%	77%	----
	All (6)	104%	104%	88%	88%	----

1. Covers all meals except night meals (Sun to Thur only) which averaged about 30.

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## **List of Acronyms**

AFM	Advance Food Menu
CS	Culinary Specialist
FF&V	Fresh Fruits and Vegetables
FSA	Food Service Attendant
JOD	Jack-of-the Dust
LPO	Leading Petty Officer
NAS	Naval Air Station
NIC	Navy Installation Command
NSRDEC	Natick Soldier Research, Development and Engineering Center
NWR	North West Region
SAM	Standard Ashore Menu
SO	Short Order
1-NSN	One National Stock Number